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TITLE OF THESIS/*TITRE DE LA THÈSE* A STUDY OF TEACHING BEHAVIORS AS THEY RELATE TO PUPIL BEHAVIORS, ACHIEVEMENT AND ATTITUDES

UNIVERSITY/*UNIVERSITÉ* U. of A.

DEGREE FOR WHICH THESIS WAS PRESENTED/ *GRADE POUR LEQUEL CETTE THÈSE FUT PRÉSENTÉE* PhD

YEAR THIS DEGREE CONFERRED/*ANNÉE D'OBTENTION DE CE GRADE* 1977

NAME OF SUPERVISOR/*NOM DU DIRECTEUR DE THÈSE* DR A MACKAY

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THE UNIVERSITY OF ALBERTA

# A STUDY OF TEACHING BEHAVIORS AS THEY RELATE TO PUPIL BEHAVIORS, ACHIEVEMENT AND ATTITUDES

by

© WALLACE V. EGGERT

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

DOCTOR OF PHILOSOPHY

DEPARTMENT OF ELEMENTARY EDUCATION

EDMONTON, ALBERTA

FALL, 1977

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Study of Teaching Behaviors as They Relate to Pupil Behaviors, Achievement and Attitudes submitted by Wallace V. Eggert in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

The main purpose of this study was to investigate the relationship between teacher behaviors and pupil behaviors, achievement and attitudes.

Six teachers at the grade one, three and six levels in two elementary schools volunteered to participate. Teacher process data were collected using the Expanded Brophy-Good Dyadic Interaction Observation System. Eight high inference rating scales were also used to obtain measures of classroom management, instructional and interpersonal skills. Process data collection extended over three weeks with ten hours of live observations in grades one and three language arts and mathematics classes and seven and one half hours of live observations in grade six language arts classes.

Metropolitan achievement tests for language arts and mathematics were administered to determine pupil achievement. Pupil attitudes were inferred from pupil responses to the Oral School Attitude Test, the Children's Attitude Inventory, the Coopersmith Self Concept Test and the My Class Inventory. The number of times a student was sent to the office for disciplinary reasons and student absenteeism were also recorded as circumstantial evidence of pupil attitudes to school. Pupil behavioral styles calculated from data collected using Spaulding's CASES observational system were also used as product measures.

Descriptive and correlational analysis of the data revealed the following:

1. Private dyadic interactions, although occurring

proportionately more often than public interactions, were generally not positively related to achievement, favored low achievers in terms of frequency, were positively related to pupil unproductive behavioral styles and were negatively related to pupil attitudes.

2. Public dyadic interactions occurred proportionately infrequently and were generally positively related to achievement. Recitation or drill sequences consisting of questions that students could answer correctly, followed by the teacher simply affirming the correct answers were positively related to pupil achievement and pupil productive behaviors and negatively related to pupil attitudes.

3. Criticism correlates negatively with achievement, attitudes and productive behaviors. Praise also correlates negatively with achievement and academic self concept.

4. Classroom management skills and teacher warmth correlate positively with pupil attitudes and productive student behaviors. Teacher persuasiveness correlates negatively with unproductive behaviors and positively with productive behaviors.

It was concluded that: (1) teaching patterns were consistent across subject matter and lesson type, (2) private dyadic interactions appear to be a function of pupil characteristics, and (3) drill or recitation lessons are functional in terms of pupil achievement and productive pupil behaviors but not in terms of pupil attitudes.

ACKNOWLEDGEMENTS

I am indebted to many people for their assistance in the completion of this work. Special thanks are due:

to Dr. D. A. MacKay, for his innovative leadership and his untiring support that made the group project and this portion of it possible,

to Dr. M. Horowitz, for his insightful and reflective manner which met the intellectual, personal and practical needs of us all,

to Dr. S. Therrien, for everything from ideas, criticisms and questions to barbeques and songs,

to Dr. T. Maguire, for his clarity, precision and empathic responses,

to Dr. W. Worth, for generously sharing encouragement and practical assistance,

to Jim Fasano, Bob Mahen, Perc Marland, Peter Moody and Dave Muttart, for their faithful friendship, hard work and encouragement,

to six courageous teachers for their professionalism, and cooperativeness at every turn,

to principals, students and staff in the training schools and the schools in which the project was conducted for their warm hospitality,

to Dr. Hunka, Craig Montgomery and John Anderson, in the Division of Educational Research Services for many hours of assistance in data preparation and analysis,

to many relatives and friends for their practical love and kindnesses extended to our family,

to my children, David, Petra, John and Joseph, for their inspiration, wisdom and good fun,

and to my wife, Kay, for her love, her faithfulness and her friendship, all of which brought enjoyment and encouragement to this work.

TABLE OF CONTENTS


| CHAPTER | | PAGE |
|---|---|---|
| I. | INTRODUCTION | 1 |
| | The Problem and Need for the Study | 1 |
| | Statement of the Problem | 3 |
| | Assumptions | 5 |
| II. | REVIEW OF RELATED LITERATURE | 10 |
| | Early History | 10 |
| | From 1957 to the Early 1970's | 12 |
| | Recent Studies of Teaching | 17 |
| | An Experimental Study | 17 |
| | Correlational Studies | 21 |
| | An Ethnographic Study | 23 |
| III. | DESIGN AND PROCEDURES | 27 |
| | The Design, the Sample and the Phases of the Study | 27 |
| | The Design | 27 |
| | The Sample | 28 |
| | The Schools | 30 |
| | The Teachers | 30 |
| | The Students | 30 |
| | The Phases in the Study | 32 |
| | The Preparatory Phase | 32 |
| | The Familiarization Phase | 32 |
| | Data Collection Phase | 33 |
| | Teacher Process Data | 33 |
| | Pupil In-class Behavioral Data | 35 |

CHAPTER PAGE

Pupil Product Data . . . . . 35

Data Sources, Training and Data Collection Procedures . . . . . 38

High Inference Rating Scales . . . . . 38

Rater Training . . . . . 40

Rating Procedures . . . . . 40

Inter-rater Reliability . . . . . 41

The Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System . . . . . 41

Intercoder Reliability during Training . . . . . 45

Intercoder Reliability during Data Collection . . 46

The Curriculum Area Methods and Materials Low Inference Observation System . . . . . 46

Product Data . . . . . 49

Pupil Behaviors . . . . . 49

CASES . . . . . 49

CASES Training and Reliability Measures . . . 51

Absenteeism and Number of Discipline Visits to Office . . . . . 55

Pupil Achievement . . . . . 55

Metropolitan Achievement Tests . . . . . 55

Report Cards . . . . . 58

Teacher Rankings . . . . . 59

Pupil Attitudes . . . . . 59

Children's Attitude Scale . . . . . 59

My Class Inventory . . . . . 60

School Attitude Test . . . . . 60

CHAPTER PAGE

Coopersmith Self-Esteem Inventory . . . . . 62

Data Analysis . . . . . 62

Data Preparation—Teacher Process Data . . . . . 62

Limitations and Expectations . . . . . 67

Limitations . . . . . 67

Expectations . . . . . 68

IV. RESULTS: REPORTED AND DISCUSSED . . . . . 69

Introduction . . . . . 69

Teacher 1 and Class 1 - Grade 1 . . . . . 72

Teacher 2 and Class 2 - Grade 1 . . . . . 91

Teacher 3 and Class 3 - Grade 3 . . . . . 107

Teacher 4 and Class 4 - Grade 3 . . . . . 121

Teacher 5 and Class 5 - Grade 6 . . . . . 138

Teacher 6 and Class 6 - Grade 6 . . . . . 150

High Inference Ratings . . . . . 163

Discussion of the Results . . . . . 163

Classroom Management Skills . . . . . 163

Instructional Skills . . . . . 167

Interpersonal Skills . . . . . 168

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS . . . . . 170

Summary . . . . . 170

Conclusions . . . . . 174

Implications and Recommendations . . . . . 175

Research . . . . . 175

Teacher Education . . . . . 176

PAGE

BIBLIOGRAPHY . . . . . 178

APPENDIX A. EXPLANATION OF THE STUDY—HANDOUT USED FOR SCHOOL PERSONNEL . . . . . 186

APPENDIX B. PROCESS DATA—INSTRUMENTS . . . . . 189

APPENDIX C. INTERCODER RELIABILITY MEASURES—LOW INFERENCE CLASSROOM OBSERVATION SYSTEM . . . . . 210

APPENDIX D. ACHIEVEMENT—TEACHER RANKINGS . . . . . 213

APPENDIX E. TABLES E-1 TO E-6. BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS . . . 215

APPENDIX F. TEACHER INTERVIEW SCHEDULE . . . . . 222

LIST OF TABLES


| TABLE | | PAGE |
|---|---|---|
| 1. | Summary of Process-Product Studies from Dunkin and Biddle Findings for Variables—Number of Process-Product Studies Relating Variable to Achievement and/or Attitudes | 15 |
| 2. | Levels of Structuring, Soliciting, and Reacting in Eight Variations of the Recitation Strategy | 19 |
| 3. | Mean Achievement of Classes (Adjusted for Aptitude) for High and Low Levels of Structuring, Soliciting, and Reacting | 20 |
| 4. | Research Findings from Correlational Studies Summarized by Borich, 1977 | 22 |
| 5. | Teacher Demographic Data | 30 |
| 6. | Distribution of Student Sample by Sex and Grade | 31 |
| 7. | Distribution of Actual Observation Periods in Classrooms across Subject, Session, Grade, and Coding Method | 36 |
| 8. | Inter-Rater Reliability Measures on Eight High Inference Rating Scales during Training | 42 |
| 9. | Inter-Rater Reliability Measures on Eight High Inference Rating Scales Obtained during Data Collection | 43 |
| 10. | Intercoder Reliability Measures Obtained with the Low Inference Classroom Observation System during Training | 47 |
| 11. | Intercoder Reliability Measures Obtained with the Expanded Brophy-Good Dyadic Interaction Classroom Observation System during Data Collection | 48 |
| 12. | CASES Reliability Measures—Percentage Agreement of Three Coders with the Training Videotape Protocols | 53 |
| 13. | CASES Reliability Measures Taken in Classrooms—Percentage Agreement between Coders during Training | 54 |
| 14. | CASES Reliability Measures—Percentage Agreement between Coders with Sample Students during Data Collection | 56 |

| TABLE | | PAGE |
|---|---|---|
| 15. | CASES Reliability Measures Taken during Data Collection—Percentage Agreement of Three Coders with the Training Videotape Protocols . . . . . | 57 |
| 16. | Pearson Product Moment Correlations between Test-Retest Scores on the MCI . . . . . | 61 |
| 17. | Pearson Product Moment Correlations between Test-Retest Scores on the SAT . . . . . | 63 |
| 18. | Pearson Product Moment Correlations between Test-Retest Scores on the Coopersmith Self-Esteem Inventory . . . . . | 64 |
| 19. | Teacher 1 - B and E Process Variables and Frequency of Interaction for High and Low Achievers on the MAT Total Reading Subtest . . . . . | 81 |
| 20. | Students of Teacher 1, Rank Ordered by Frequency and Proportion of Interaction, Achievement Scores, Attitude Scores and Frequency of Discipline Problems and Absenteeism . . . . . | 82 |
| 21. | Teacher 1 - Correlations between Teacher B and E Process Variables and Student Achievement, Attitudes, and Discipline and Absentee Frequence . . . . | 83 |
| 22. | Teacher 1 - Correlations between B and E Teacher Variables and Pupil Behavioral Styles as Determined by CASES Data . . . . . | 84 |
| 23. | Teacher 2 - B and E Process Variables and Frequency of Interaction for High and Low Achievers on the MAT Total Reading Subtest . . . . . | 99 |
| 24. | Students of Teacher 2, Rank Ordered by Frequency and Proportion of Interaction, Achievement Scores, Attitude Scores and Frequency of Discipline Problems and Absenteeism . . . . . | 101 |
| 25. | Teacher 2 - Correlations between Teacher B and E Process Variables and Student Achievement, Attitudes, and Discipline and Absentee Frequence . . . . | 103 |
| 26. | Teacher 2 - Correlations between B and E Teacher Variables and Pupil Behavioral Styles as Determined by CASES Data . . . . . | 104 |

TABLE PAGE

27. Teacher 3 - B and E Process Variables and Frequency of Interaction for High and Low Achievers on the MAT Total Reading Subtest . . . . . 115

28. Students of Teacher 3, Rank Ordered by Frequency and Proportion of Interaction, Achievement Scores, Attitude Scores and Frequency of Discipline Problems and Absenteeism . . . . . 116

29. Teacher 3 - Correlations between Teacher B and E Process Variables and Student Achievement, Attitudes, and Discipline and Absentee Frequence . . . . 118

30. Teacher 3 - Correlations between B and E Teacher Variables and Pupil Behavioral Styles as Determined by CASES Data . . . . . 119

31. Teacher 4 - B and E Process Variables and Frequency of Interaction for High and Low Achievers on the MAT Total Reading Subtest . . . . . 130

32. Students of Teacher 4, Rank Ordered by Frequency and Proportion of Interaction, Achievement Scores, Attitude Scores and Frequency of Discipline Problems and Absenteeism . . . . . 131

33. Teacher 4 - Correlations between Teacher B and E Process Variables and Student Achievement, Attitudes, and Discipline and Absentee Frequence . . . . 133

34. Teacher 4 - Correlations between B and E Teacher Variables and Pupil Behavioral Styles as Determined by CASES Data . . . . . 134

35. Teacher 5 - B and E Process Variables and Frequency of Interaction for High and Low Achievers on the MAT Total Reading Subtest . . . . . 143

36. Students of Teacher 5, Rank Ordered by Frequency and Proportion of Interaction, Achievement Scores, Attitude Scores and Frequency of Discipline Problems and Absenteeism . . . . . 145

37. Teacher 5 - Correlations between Teacher B and E Process Variables and Student Achievement, Attitudes, and Discipline and Absentee Frequence . . . . 146

38. Teacher 5 - Correlations between B and E Teacher Variables and Pupil Behavioral Styles as Determined by CASES Data . . . . . 147

TABLE

PAGE


39. Teacher 6 - B and E Process Variables and Frequency of Interaction for High and Low Achievers on the MAT Total Reading Subtest . . . . . 156

40. Students of Teacher 6, Rank Ordered by Frequency and Proportion of Interaction, Achievement Scores, Attitude Scores and Frequency of Discipline Problems and Absenteeism . . . . . 157

41. Teacher 6 - Correlations between Teacher B and E Process Variables and Student Achievement, Attitudes, and Discipline and Absentee Frequence . . . . 159

42. Teacher 6 - Correlations between B and E Teacher Variables and Pupil Behavioral Styles as Determined by CASES Data . . . . . 160

43. Summary of High Inference Ratings for Six Teachers . . . 164

44. Spearman Rank Correlation Coefficients between High Inference Ratings on Teacher Process Variables and Pupil Achievement, Attitude and Behaviors . . . . . 165

45. Summary of Results of Correlations between Teacher Behaviors and Pupil Achievement, Attitudes, Self Concept and Behaviors . . . . . 172

LIST OF FIGURES


| FIGURE | | PAGE |
|---|---|---|
| 1. | A Model for the Study of Classroom Teaching | 7 |
| 2. | Early Landmark Studies in the Study of Teacher Effectiveness | 11 |
| 3. | Summary of the Four Phases of the Study | 37 |
| 4. | Data Sources | 39 |
| 5. | Transference of Raw Data to Secondary Coding Sheets Raw Data as Collected from the Classroom | 66 |
| 6. | Teacher No. 1 in Language Arts. Nature of Public Interactions—Proportions | 73 |
| 7. | Teacher No. 1 in Language Arts. Nature of Private Interactions—Proportions | 74 |
| 8. | Teacher No. 1—Proportion of Main Interaction Sequences in Language Arts | 75 |
| 9. | Teacher No. 1 in Maths. Nature of Public Interactions—Proportions | 76 |
| 10. | Teacher No. 1 in Maths. Nature of Private Interactions—Proportions | 77 |
| 11. | Teacher No. 1—Proportion of Main Interaction Sequences in Mathematics | 78 |
| 12. | Teacher No. 2 in Language Arts. Nature of Public Interactions—Proportions | 92 |
| 13. | Teacher No. 2 in Language Arts. Nature of Private Interactions—Proportions | 93 |
| 14. | Teacher No. 2—Proportion of Main Interaction Sequences in Language Arts | 94 |
| 15. | Teacher No. 2 in Maths. Nature of Public Interactions—Proportions | 95 |
| 16. | Teacher No. 2 in Maths. Nature of Private Interactions—Proportions | 96 |
| 17. | Teacher No. 2—Proportion of Main Interaction Sequences in Mathematics | 97 |

FIGURE PAGE


18. Teacher No. 3 in Language Arts. Nature of Public Interactions—Proportions . . . . . 108

19. Teacher No. 3 in Language Arts. Nature of Private Interactions—Proportions . . . . . 109

20. Teacher No. 3—Proportion of Main Interaction Sequences in Language Arts . . . . . 110

21. Teacher No. 3 in Maths. Nature of Public Interactions—Proportions . . . . . 111

22. Teacher No. 3 in Maths. Nature of Private Interactions—Proportions . . . . . 112

23. Teacher No. 3—Proportion of Main Interaction Sequences in Mathematics . . . . . 113

24. Teacher No. 4 in Language Arts. Nature of Public Interactions—Proportions . . . . . 122

25. Teacher No. 4 in Language Arts. Nature of Private Interactions—Proportions . . . . . 123

26. Teacher No. 4—Proportion of Main Interaction Sequences in Language Arts . . . . . 124

27. Teacher No. 4 in Maths. Nature of Public Interactions—Proportions . . . . . 125

28. Teacher No. 4 in Maths. Nature of Private Interactions—Proportions . . . . . 126

29. Teacher No. 4—Proportion of Main Interaction Sequences in Mathematics . . . . . 127

30. Teacher No. 5 in Language Arts. Nature of Public Interactions—Proportions . . . . . 139

31. Teacher No. 5 in Language Arts. Nature of Private Interactions—Proportions . . . . . 140

32. Teacher No. 5—Proportion of Main Interaction Sequences in Language Arts . . . . . 141

33. Teacher No. 6 in Language Arts. Nature of Public Interactions—Proportions . . . . . 151

34. Teacher No. 6 in Language Arts. Nature of Private Interactions—Proportions . . . . . 152

FIGURE · TABLE

35. Teacher No. 6—Proportion of Main Interaction Sequences in Language Arts . . . . . 153

Chapter I

# INTRODUCTION

## The Problem and Need for the Study

In the past two decades, teaching effectiveness studies have been relatively few and have yielded conflicting and inconsistent results (Rosenshine, 1971, 1976; Heath and Nielson, 1974). Many of these studies, using systematic observation of teaching, have been done outside of real classrooms with subjects other than real working teachers and learners. There exists therefore a "shortage of data on teacher behavior in naturalistic teaching situations" (Brophy and Evertson, 1976, p. 7). It is because of this lack of data generated by studies done in real classrooms that Brophy has justifiably said, "research on teaching literally is in its infancy" (Brophy, 1976a, p. 34), and ". . . is truly primitive" (Brophy, 1976b, p. 21).

At the same time concerned educational leaders attempt to improve the quality of education by funding a variety of innovative teacher education programs. But because of our lack of knowledge of the relationship between teacher behavior and student outcomes, these "improvements" must of necessity be justified "with unsubstantiated 'logic' or 'theory'" (Rosenshine and Furst, 1971, p. 64). Recently J. Brophy (1976b) in commenting on teacher training protocol materials said:

> the knowledge base about how to accomplish teacher training goals . . . is ahead of the knowledge base supporting the efficacy or desirability of the skills included in the

> content of these training efforts . . . Thus, I would urge everyone connected with educational research to help develop this knowledge base further (p. 7).

Our understanding of teaching, learning, and the development of teacher education curricula, is fundamentally linked to our knowledge of relationships between teacher behaviors and pupil learning. It seems reasonable to suggest that we are more likely to enhance the quality of education by building our programs on "an accumulation of process-product evidence" (Dunkin, 1976, p. 177) rather than on "the results of one or just a few investigations, or conventional wisdom, or individual insights" (p. 177).

The need for classroom process-product evidence can also be justified by pointing to the quality of research on teaching. An examination of what has been done in this area reveals a number of problems. Recently, Berliner (1976a) has discussed some of the difficulties facing researchers who attempt teaching effectiveness studies, in an article entitled "Impediments to the Study of Teaching Effectiveness" (p. 5). He presents the problems as follows:

1. Problems of instrumentation:

   the inadequacy of standardized tests, the unknown predictive validity of tests from special teaching units, the problem of building multivariate outcome measures, the problems of measurement of appropriateness of teacher behavior, the lack of experience in choosing an appropriate unit of analysis for describing teaching behavior, and the lack of stability of many teacher behaviors.

2. Problems of methodology:

   problems of how student background affects measures of teacher effectiveness, what subject matter should be examined, how normative standards and volunteer teachers affect what can be said about teachers and teaching, how individual students react to teaching skills, and how students monitor and interpret a teacher's behavior in ways which may or may not coincide

with how educational theorists interpret the phenomena. Time and resources are needed to do construct validation and studies of the generalizability of measures of teacher effectiveness.

3. Problems of statistics:

guidance is needed for choosing techniques to use for measurement of change in the achievement of students in natural classrooms. (p. 12)

There exists, therefore, a need for process-product data generated from a study of teachers and learners in real classrooms. Such research must continually attempt to solve the problems of instrumentation, methodology and inappropriate use of statistics.

## Statement of the Problem

The main purpose of this study was to investigate various components of classroom processes as they relate to pupil product measures. Concomitant purposes were methodological in nature; that is, the question of how components of classroom processes are best investigated or captured was also of concern.

An examination was made of the following classroom processes:

1. teacher-pupil dyadic interaction using a low inference multiple coding category system (Brophy and Evertson, 1973),

2. teacher use of methods, and curriculum materials, using a low inference multiple coding category system (Brophy and Evertson, 1973), and

3. teacher classroom management skills, interpersonal skills and instructional skills, using high inference rating scales.

The classroom processes observed and measured in a variety of ways were analysed in relationship to pupil product measures of

behaviors, achievement and attitudes.

More specifically, this study sought answers to the following questions.

1. What are the detailed interaction sequences of the teachers under study as described by the Expanded Brophy-Good teacher-pupil dyadic interaction observation system (Brophy and Evertson, 1973)?

2. What amounts of the teacher's main interaction sequences and variables are afforded different groups of pupils?

3. What relationships exist between the main interaction sequences and other variables derived from the Expanded Brophy-Good teacher-pupil dyadic interaction observations system and:

   (a) pupil behaviors, as measured by Spaulding's Coping Analysis Schedule for Educational Settings (CASES);

   (b) pupil behaviors - as measured by absenteeism and disciplinary action taken by the school administration;

   (c) pupil achievement - as measured by the Metropolitan Achievement Test (MAT), report card grades, and teacher rankings of pupil effort and achievement; and

   (d) pupil attitudes - as measured by the Children's Attitude Scale, the My Class Inventory, the School Attitude Test and the Coopersmith Self-Esteem Inventory?

4. What is the relationship between variables derived from a low inference curriculum area materials and methods observational system and pupil product measures (as above)?

5. What is the relationship between mean ratings of teacher classroom management skills and pupil product measures?

6. What is the relationship between mean ratings of teacher classroom interpersonal skills and pupil product measures?

7. What is the relationship between mean ratings of teacher classroom instructional skills and pupil product measures?

## Assumptions

Several assumptions about teaching and learning have a bearing on the statement of the problem, on data sources to be used, and on what procedures and design should be implemented. The explicit assumptions are:

1. Teachers, and what they do in the classroom, do in fact make a difference.

### Discussion of Assumption Number 1

Recently researchers have attempted to show that schools and teachers have insignificant effects on pupil outcome measures. The most important predictors of pupil achievement are seen to be pupil ability and/or socio-economic status (Coleman et al., 1966; Jencks et al., 1972). Good, Biddle and Brophy (1975) have pointed out that because of "serious design and methodological deficiencies" the data from the Coleman and Jencks studies are "not definitive." In fact studies which have used the individual teacher, rather than the school, as the unit of analysis have demonstrated that teachers

do make a difference (Brophy, 1973; Veldman and Brophy, 1974). More specifically MacDonald (1976) in a study designed to determine the relative influence of teaching performance on learning compared to certain pupil presage variables found that:

> 1. teaching performances accounted for a third to a half of the variance in pupil spring scores when their fall scores were partialled out, and that;
>
> 2. teaching performances account for about half of the variance in mean-change scores. (p. 7)

2. Teaching and learning involve a large number of interacting forces and the nature of these interactions are extremely complex.

Discussion of Assumption Number 2

A study of teaching and learning must of necessity be complex, attempting to include a large number of variables. Because of this complexity it would be presumptuous to think that a single observable teaching behavior divorced from numerous other related variables would necessarily produce some measurable pupil effect.

This study is therefore part of an extensive group research project (Eggert, Fasano, Mahan, Marland, Moody and Muttart, 1976), which used the Dunkin and Biddle model as a guide for the study of classroom teaching (Figure 1).

Important questions which emerge from the model are:

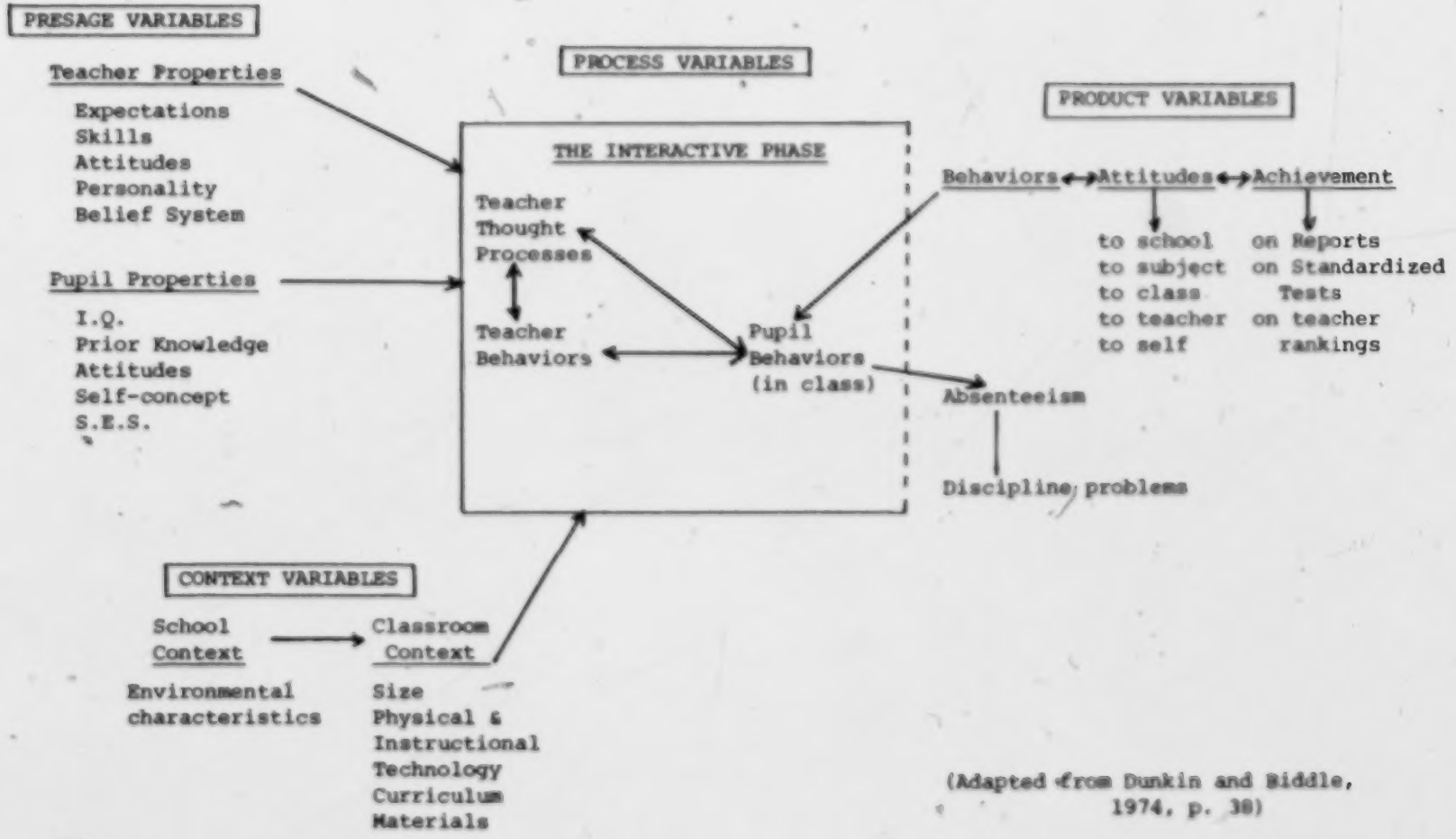
1. What are the relationships between teacher presage variables and teacher classroom process variables? (Muttart)

2. What are the relationships between pupil presage variables and pupil classroom process variables? (Fasano)

3. What are the relationships among contextual variables,

FIGURE 1

A MODEL FOR THE STUDY OF CLASSROOM TEACHING




(Adapted from Dunkin and Biddle, 1974, p. 38)

pupil perceptions of classroom life and pupil product variables? (Moody)

4. What are the relationships between teacher classroom process variables and product variables? (Eggert)

5. What are the relationships between pupil classroom behavior variables and pupil achievement and attitude? (Mahen)

6. What is the nature of the interactive thought processes of teachers? (Marland)

The focus of this study is question number four above, and seen in context, is but one part of the larger study.

3. Teacher-pupil interactions are most appropriately conceptualized as dyadic interactions rather than as interactions between the teacher and the class-as-a-whole.

Discussion of Assumption Number 3

Observation systems which limit the analysis of data to a class perspective assume (1) that teacher behaviors are consistent across students in a classroom and (2) that teacher interactions are teacher-class interactions (Good and Brophy, 1970). Some have argued that the class should in fact be the unit of analysis in teacher effectiveness studies because the teacher is responsible for a class. On the other hand others have pointed out that it is, after all, the individual student who does the learning and therefore the student should be the unit of analysis. The Expanded Brophy-Good (Brophy and Evertson, 1973) classroom observation system allows for both types of analysis in that it provides separate data for individual students:

4. Another important assumption is that studying teaching must include phenomenological analysis.

Discussion of Assumption Number 4

Studying teaching from a traditional behavioristic viewpoint will result in serious limitations. Psychology involves not only the study of behaviors. It must also include the study of the mind. Making this assumption has implications for research methodology. A study of the mental life of teachers and learners means that we need

> longitudinal case studies, anthropological analysis of classrooms and teachers, information-processing modellings of the thought processes of teachers and learners using methods of controlled introspection and retrospection . . . (Shulman, 1974, p. 335).

Teacher thought processes were not analyzed in this study. However, making the assumption that the study of teaching must include phenomenological analysis, along with making the other three assumptions stated above, affected the decision taken to limit the size of the sample under study to six teachers, one grade one, one grade three, and one grade six, in each of two schools.

## Chapter II

## REVIEW OF RELATED LITERATURE

The discussion in this chapter will focus on three main areas: (1) early history of research on teaching effectiveness, (2) research on teaching effectiveness from 1957 to the early 1970's and (3) a summary of recent studies of teaching.

### Early History

Attempts to answer the question, "What makes a good teacher?" began as early as 1896 (Medley, 1972/4, p. 430). In this section the discussion is limited to studies since the turn of the century that have served as models for subsequent research. These landmark studies have been summarized in Figure 2.

Much of the research prior to 1957 did not use objective measures of teacher behavior in seeking to determine teacher effectiveness and did not use measurable changes in pupil behaviors as a criterion of teacher effectiveness. Supervisory ratings of teacher effectiveness were used as the criterion. These ratings were consistently found to be unrelated to pupil growth (Medley and Mitzel, 1963). Medley (1972/4) has therefore concluded that a study of this early research will not further our knowledge of teacher effectiveness. However, as can be seen in Figure 2, there were some exceptions to these methodological inadequacies.

Studies by Jayne and Anderson, reflecting the influence of

FIGURE 2

EARLY LANDMARK STUDIES IN THE STUDY OF TEACHER EFFECTIVENESS

| RESEARCHER | FOCUS | CONTRIBUTIONS |
|---|---|---|
| A. S. BARR (1945) | To identify and describe prerequisites to teaching efficiency. | 1. Prolonged group research efforts—from 1920's to 1960.<br>2. Attempted more objective behavioral studies.<br>3. First to use measurable pupil changes as criterion of teaching ability in addition to ratings of effectiveness by administrators. |
| C. D. JAYNE (1945) | To seek relationships between observable teacher activities and pupil gain scores. | 1. Student of A. S. Barr who was first to analyze sound recordings of teaching using a low inference observation system.<br>2. Findings re importance of teacher discussion, structuring and questioning make his work an important antecedent to many cognitive interaction studies. |
| LEWIN, LIPPITT & WHITE (1939) | To examine the differential effects of authoritarian, democratic and "laissez-faire" leader behavior. | 1. Leadership type is related to degrees of interpersonal tension, hostility and aggression and productiveness.<br>2. Concepts are important precursor to Flanders' concepts.<br>3. Verbal behavior categories differentiated leader-behavior styles more adequately than social-behavior categories. |
| H. H. ANDERSON (1939-46) | To study dominative and socially integrative teacher behavior. | 1. Integrative patterns of teacher behavior were related to more spontaneity and initiative behavior of children. Where domination prevailed, children were less responsive.<br>2. Concepts of integration and domination are forerunners to Flanders' concepts of indirect and direct influence. |
| J. WITHALL (1949) | Extending the work of Anderson and Lewin et al., he renamed Anderson's I-D index calling it socio-emotional climate. Withall developed an instrument for use in assessing socio-emotional climate. | 1. Developed a seven category system to analyze the verbal interaction of teachers, which is a continuum from teacher-centeredness to learner-centeredness.<br>2. The seven categories are very similar to Flanders' early 10 category system. |
| N. FLANDERS (1955-56) | To study the effects of teacher influence—direct and indirect on student attitudes. | 1. Early IA studies served to develop and refine procedures for classroom observation and testing of pupil attitudes.<br>2. The beginning of the modern era of research on teaching FIAC or modifications thereof, have dominated in the field of research on teaching effectiveness which has allowed for an accumulation of process-product evidence within the indirect-direct teacher influence orientation. |

detailed observation schedules used in the child study movement, began to define the behavior of teachers using broad dimensions which were a composite of a number of micro behavioral categories. Anderson's climatic dimensions can be traced through the work of Withall, Flanders and Spaulding, whereas Jayne's cognitive dimensions led to Medley and Mitzel's OSCAR (1958). Since then, numerous observation systems focusing on both climatic and cognitive aspects of teaching have been developed. "The decade of the sixties brought with it over 300 easily identifiable category and rating systems designed for research in the classroom" (Furst, 1972/4, p. 576).

## From 1957 to the Early 1970's

The period of research on teacher effects from 1957 to the early 1970's is referred to as the modern era (Rosenshine, 1976). The most widely referred to reviews of studies done during this time are those of Rosenshine (1971), Rosenshine and Furst (1971), and Dunkin and Biddle (1974).

Rosenshine reviews approximately 51 studies in his 1971 book. The studies are similar in that most are correlational, were conducted in classroom settings, used adjusted measures of student achievement and used the class as the unit of analysis. The studies vary however in other important ways: the length of instructional time studied, the time of year for administering tests, the methods of data analysis used, the grade levels and subject areas under study, to name but a few. The variation among the studies reviewed presents some problems for the reviewer. For example, Rosenshine chooses to group the

findings by variables. In his 1971 review he has six categories or chapter titles: (1) teacher approval and disapproval, (2) teacher cognitive behaviors, (3) flexibility and variety, (4) enthusiasm, (5) amount of teacher-student interaction, and (6) time. In the Rosenshine and Furst 1971 review, the six categories used in the Rosenshine (1971) review became eleven variables for grouping the same findings (the findings were, incidentally, abstracted from his 1971 review). They are (1) clarity, (2) variability, (3) enthusiasm, (4) task-oriented and/or businesslike behaviors, (5) student opportunity to learn criterion material, (6) use of student ideas and general indirectness, (7) criticism, (8) use of structuring comments, (9) types of questions, (10) probing, and finally, (11) level of difficulty of instruction. And then Rosenshine and Furst (1973), again referring to the same set of "50 odd studies" (p. 155) discuss the findings using nine variables, namely, (1) clarity, (2) variability, (3) enthusiasm, (4) task oriented and/or businesslike, (5) criticism, (6) teacher indirectness, (7) student opportunity to learn criterion material, (8) use of structuring comments and (9) multiple levels of questions or cognitive discourse. In each of these reviews of essentially the same studies, the variables used to group the findings are presented as those which "have yielded the most significant and/or consistent results" (Rosenshine and Furst, 1973, p. 155).

It becomes clear that the problem facing any reviewer is one of classification and interpretation, particularly when reviewing studies that vary considerably in their operational definitions of teaching behaviors observed.

Heath and Neilson (1974) in evaluating the Rosenshine and Furst 1971 review, have said:

> Our judgement concerning the appropriateness of the operational definition to the variable cited is indicated. In our judgement, 26 of the 84 operational definitions of teacher behavior do not correspond to the variable cited. (Heath & Neilson, 1974, p. 471)

Heath and Neilson (1974) therefore conclude that the "operational definitions of both teaching and achievement" in the reviewed literature are "sterile" (p. 481). Granted there are problems of operational definitions within many of the observation systems used, and admittedly, the reviewers attempts at grouping the findings may be invalid. But these problems hardly warrant "the label of general sterility" (Jackson, 1976, p. 47). Nor are the findings of the particular studies reviewed invalid. Nevertheless the findings reported by Rosenshine's reviews are inconclusive. The available process-product relational evidence is inadequate, particularly as an empirical base for competency based teacher education programs.

A much more comprehensive review of studies using classroom observation has been done by Dunkin and Biddle (1974). But here too, what at first appears to be a massive accumulation of process-product evidence turns out to be not so. Dunkin and Biddle (1974) summarize their review of the 178 studies in chapter eleven—"Findings for Teachers" (p. 357). The process-product evidence is indeed inconclusive and inconsistent. Table 1 summarizes the ten charts of findings for teachers presented by Dunkin and Biddle's chapter eleven, extracting only the process-product studies. It becomes clear that the field of classroom analysis research has been dominated by those

TABLE 1 *

SUMMARY OF PROCESS-PRODUCT STUDIES FROM DUNKIN AND BIDDLE FINDINGS FOR VARIABLES—NUMBER OF PROCESS-PRODUCT STUDIES RELATING VARIABLE TO ACHIEVEMENT AND/OR ATTITUDES

| Studies of | Variable | Pupil Achievement | | | Pupil Attitudes | | |
|---|---|---|---|---|---|---|---|
| | | Related | Unrelated | Cur. or Com.* | Related | Unrelated | Cor. or Com.* |
| Indirectness climate | 1. Indirectness | 10 | 20 | 6 | 9+ | 5 | |
| | 2. Praise or approval | 3 | 11 | 1 | 1+ | 4 | |
| | 3. Acceptance of pupils' ideas | 1 | 6 | 1 | 3+ | 3 | |
| | 4. Criticism or disapproval | 6(lower) | 7 | 1 | 2- | 3 | |
| Directiveness | 5. Teacher talk | | 7 | | 1+ 2- | 4 | |
| | 6. Teacher questions | 1 | 6 | | 1+ | | |
| | 7. Teacher lecturing | 1 | | | | | |
| | 8. Pupil talk | | 5 | | | | |
| | 9. Pupil res. to T. initiations | 1 | | | | | |
| Beh. Mod. | 10. T. use of tokens | 2(target) | | | | | |
| | 11. T. use of vicarious reinforcement | 1(nontarget) | | | | | |
| Classroom as social system | 12. T. emission of Pos. moves | | 1 | | | | |
| | 13. T. emission of Pos. reactions | 2 | | | | | |
| | 14. T. emission of Str. moves | | 1 | 1 | | | |
| | 15. T. use of gesture and movement | 1 | | | | | |
| | 16. "Stimulation" - media | | | 1 | | 1 | |
| Knowledge & intellect | 17. T. use of higher order categories | | 1 | 1 | | | |
| | 18. Divergent rather than convergent | | | 1 | | | |
| | 19. P. use of higher thought levels | | 1 | 1 | | | |
| | 20. T. seeks to lift thought levels | | 1 | | | | |
| | 21. T. extends thought on same level | | 1 | | | | |
| | 22. Analytic and evaluative rather than empirical processes | 1 | | | | | |
| | 23. Higher cognitive demand | | 1 | 1 | | | |
| Linguistic concepts | 24. Vagueness | 1(lower) | | | | | |
| | 25. Optimal amount of information | | | 1 | | | |
| | 26. Verbal fluency | 1 | | | | | |
| | 27. Interest | | | 1 | | | |
| | 28. T. use of explicit logic | 1 | | | | | |
| Sequence | 29. Sol Res Rea | 1 | | | | | |
| | 30. Redirect questions | 1 | | | | | |
| | 31. Length of episodes | | | 1 | | | |
| | 32. Episode-terminal structuring Rea | 1 | | | | | |
| | 33. Post question structuring - Sol Rea | 1(lower) | | | | | |
| Strategic units | 34. Ventures combining descriptions and instances | 1 | | | | | |
| | 35. Lesson - terminal summary | 1 | | | | | |

*Cur. or Com. = Curvilinear or complex relationships.

in the Flanders' tradition (note the number of studies in the first three categories, Indirectness, Climate and Directness). It is also clear that there are some very serious gaps. (1) Very few investigators have used observational systems emphasizing the cognitive dimensions of teaching and learning. (2) Dunkin and Biddle report no process-product data in the area of classroom management. (3) Only one investigator outside of the Flanders' tradition looked at pupil attitudes as a product measure. (4) Very few observation systems have been used more than once or twice either by one investigator or by more than one investigator. For example, findings from studies of sequence units, using the Bellack system, are from two studies only (Bellack et al., 1966 and Wright and Nuthall, 1970). And finally (5) few investigators have used non-achievement* pupil outcome measures (that is, pupil in-class coping behaviors).

Dunkin and Biddle's (1974) conclusions are similar to those of Rosenshine and Furst's. They too conclude that the findings are "tentative" and unconfirmed. They refer to the "Findings for Teachers" in Chapter XI (1974) as "suggestive" (p. 148). But it is clear that these findings are suggestive for further research, not for preferred teaching styles or behaviors (Flanders, 1976).

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*"non-achievement" is a term used by Bossert (1976), referring to pupil outcomes such as "cooperation, competition, independence and self-direction, and the development of moral autonomy" (p. 9).

## Recent Studies of Teaching

The reviews of Rosenshine and Furst, and Dunkin and Biddle, have not only stimulated much discussion about what is known about teaching but have influenced much of what is presently being done in the area of teacher effectiveness.

### 1. An Experimental Study

There are those who have examined the reviews and have moved from the correlational type study to a more tightly controlled experimental design (Gage, 1976; Gall et al., 1976). The Stanford recitation study (Gage, 1976) took the "teacher behaviors which earlier survey research had suggested were related to student achievement" (p. 35) and embedded them in definitions of high and low levels of structuring, soliciting and reacting.

HIGH STRUCTURING consisted of:

- *reviewing* the main ideas and facts covered in a lesson, at the end of a lesson and at the beginning of the next lesson;
- *stating objectives* at the beginning of a lesson;
- *outlining the lesson* content;
- *signaling transitions* between parts of a lesson;
- *indicating important points* in a lesson;
- *summarizing* the parts of the lesson as the lesson proceeded.

LOW STRUCTURING consisted of:

- the absence of teaching behaviors associated with high structuring.

HIGH SOLICITING consisted of:

- *asking a relatively large proportion (about 60 percent) of questions which required the students to do more than simply recall information* (Asking the students to combine facts to form principles, compare or contrast, interpret, or evaluate are typical examples of high soliciting.);

- *waiting in silence a relatively long time* (three seconds or more) after a student response, to encourage elaboration; and before calling on a second student when the first student called on failed to respond correctly or completely.

LOW SOLICITING consisted of:

- *asking a relatively large proportion (about 85 percent) of questions requiring students simply to recall information;*
- *waiting in silence a relatively short time* (less than three seconds) after a student response, and before calling on a second student after the first student called on failed to respond correctly or completely.

HIGH REACTING consisted of:

- *praising correct responses;*
- *providing reasons* when a student response was judged to be incorrect;
- *prompting* by providing a hint when a student response was incorrect or incomplete;
- *writing correct student responses* on the chalkboard.

LOW REACTING consisted of:

- *using neutral feedback* (e.g., "OK," "uh huh") after correct student responses;
- *not providing reasons* when a student response was judged to be incorrect;
- *probing* by asking a student to continue or elaborate a response.

Four teachers were trained to teach variations of the recitation strategy.

Table 2 shows the level of structuring, soliciting, and reacting used in each variation. (Gage, 1976, p. 35)

The results of the Stanford recitation study showed that variations in recitation strategies had very little effect on pupil achievement in ecology (see Table 3) and on pupil attitudes toward ecology.

TABLE 2

LEVELS OF STRUCTURING, SOLICITING, AND REACTING IN EIGHT VARIATIONS OF THE RECITATION STRATEGY

| Variation | Structuring | Soliciting | Reacting |
|---|---|---|---|
| 1 | HIGH | HIGH | HIGH |
| 2 | HIGH | HIGH | low |
| 3 | HIGH | low | HIGH |
| 4 | HIGH | low | low |
| 5 | low | HIGH | HIGH |
| 6 | low | HIGH | low |
| 7 | low | low | HIGH |
| 8 | low | low | low |

(Gage, 1976, p. 35)

TABLE 3

MEAN ACHIEVEMENT OF CLASSES (ADJUSTED FOR APTITUDE) FOR HIGH AND LOW LEVELS OF STRUCTURING, SOLICITING, AND REACTING

| Variation | Number of Students | Mean Achievement on Immediate Test | Mean Achievement on Retention Test |
|---|---|---|---|
| High Structuring | 213 | 20.46 | 19.14 |
| Low Structuring | 195 | 19.97 | 18.42 |
| High Soliciting | 211 | 19.66 | 18.37 |
| Low Soliciting | 197 | 20.83 | 19.26 |
| High Reacting | 202 | 20.41 | 19.32 |
| Low Reacting | 206 | 20.04 | 18.28 |

(Gage, 1976, p. 37)

The recitation study sacrificed ecological validity* in favor of contextual controls, that is, an experimental teaching unit (E.T.U.) (9 lessons on ecology) was used as the curriculum, and teaching methods were explicitly prescribed. In effect the E.T.U. became the teachers' script. Such role-playing has great appeal and utility for the researcher in that it enables teacher variables to be manipulated. "Yet it can also lead to grotesque caricature" (Wragg, 1972/4, p. 571). Fortunately the Stanford study did not make their low structure, low solicit and low react too low. In fact all the students in the study "learned a great deal under all variations of the recitation strategies" (Gage, 1976).

2. Correlational Studies

Borich (1977) has summarized, in tabular form, several studies which may well be contrasted with the one used at Stanford (see Table 4). Brophy-Evertson, Soar, Stallings, Good-Grouws and McDonald have responded to the Rosenshine and Furst and Dunkin and Biddle reviews with less optimism than the Stanford experimenters. This is evidenced by their attempts to strengthen or accumulate more process-product data through conducting more correlational studies. In choosing variables for their studies, they too, sought to incorporate the findings and suggestions of Rosenshine and Furst (1971) and Dunkin and Biddle (1974).

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*ecological validity—"the creation of each aspect of the experimental context so that it reflects 'real' classroom teaching" (Gall, 1976, p. 1).

TABLE 4

RESEARCH FINDINGS FROM CORRELATIONAL STUDIES SUMMARIZED BY BORICH, 1977

| Brophy-Evertson | Soar | Stallings | Good-Grouws | McDonald |
|---|---|---|---|---|
| Teacher responds to each question +L* Making sure student understands +L* | | Provides information/ asks question (systematic instructional pattern) + | | |
| | | Use of small groups + | Teaching whole class + | Teaching whole class + |
| Specialized materials +L | | Use of textbooks and workbooks + | | Variety of instructional materials − |
| Praise after student answers opinion questions +L Student initiated praise −L | | Praise** | Praise − | |
| Flexibility of rules + | | Flexible classrooms + | | |
| Controlling student responses +L, −H Teacher structuring and feedback −L | Direction and control of learning ∩ *** Unobtrusive structuring behavior −L, +H | | | Time organizing instructional activity − |
| Interacting with individuals during group lessons + | Teacher-pupil interaction at high cognitive level − | | Teacher afforded contact with students − | |
| Teacher affect +L, 0H | Teacher affect +L, −H | | | |
| Keeping students actively engaged + | | | | Maintaining task involvement − |
| | | | Time teaching whole class + | Content covered + |
| Student initiated questions + | | | Student initiated interaction + | |
| Clarity 0 | | | Clarity + | |
| Getting groups' attention + | | | Alerting behavior + | |
| Giving student correct answer + Responding to substance rather than form + Failure to give feedback − | | | Process feedback − | |

Note: + indicates positive relationship to pupil achievement, − indicates negative relationship, 0 indicates no relationship.

*L indicates finding for low-SES pupils only, H indicates finding for high-SES pupils only.

**The effect of praise on achievement in math in first grade was variable: in classrooms where children had relatively low entering ability, pupils profited more from a high rate of praise than they did in classrooms where students had higher entering ability.

***Soar's inverted U, indicating a curvilinear relationship between direction and control of learning and pupil achievement.

(From: Borich, 1977, p. 77)

An examination of the Brophy and Evertson Texas studies (Brophy and Evertson, 1976), leads one to conclude that methodology for research in naturalistic settings has improved considerably. The use of both high and low inference observation systems, the multiple-coding category systems used, the length of time actually spent observing in the classroom, the collection of presage, process and product data, and the separate analysis of the data for high and low SES schools reflects both an awareness and a consideration of the complexity of teaching and learning in naturalistic settings. These Texas studies were the main source of instrumentation on teacher processes for the present investigation.

3. An Ethnographic Study

There is at least one other reaction to the research on teaching done in the sixties. D. Berliner (1976b), principal investigator of the Beginning Teacher Evaluation Study, has recently stated:

> The BTES staff believed that "single-act" psychology and hypothesis-testing psychology had yielded little of value for studying the complex world of the classroom. Thus, it became necessary to look elsewhere for a way of viewing classroom phenomena . . . Lutz and Ramsey (1974) have been concerned that the teaching acts and learning outcomes studied to date are only those which, for the most part can be subjected to measurement by paper and pencil tests and/or by behaviorally defined coding systems. Descriptions of the activity in a classroom, therefore, have been limited by the 'screens' through which events have been recorded (p. 24).

Critical examinations of research on teaching and of the present modes of research in psychology by Cronbach (1975) and Campbell (1974) had also influenced the BTES staff. The result was the design and implementation of an ethnographic study of the teaching-learning process.

Forty "sites" (teachers and their classes) were selected from 200 volunteers to teach two week E.T.U.'s on reading and mathematics. Residual gain scores were used to determine 10 "more-effective" and 10 "less-effective" teachers. Twelve ethnographers (doctoral candidates in anthropology or sociology) were trained to write and then provide educational protocols (five reading and mathematics class protocols, three informal protocols and one summary protocol). Six raters then analyzed the protocols and generated a list of over 200 concepts with definitions and examples. The concepts were then combined into 61 variables which had been focused on by the six raters, and had appeared most frequently in the protocols.

The 61 variables were defined and shaped into The Classroom Comparison Instrument Rating forms. Twenty raters provided 18 ratings on each variable for more and less effective teachers in second and fifth grades in reading and mathematics. Twenty-one variables were found to be generic, "that is, these variables discriminated between more- and less-effective teachers" (Berliner, 1976b, p. 30) in each of the four contexts. Fourteen of these variables were teacher variables and they were as follows:

* 1. accepting
* 2. attending
* 3. belittling
* 4. consistency of message (control)
* 5. filling time
* 6. illogical statements
7. knowledge of subject
8. monitoring learning
9. oneness
10. optimism
*11. pacing
12. promoting self-sufficiency
*13. spontaneity
*14. structuring

*See next page

It is interesting to note that at least nine of the above variables (*) appear to be similar to variables which also emerge from the Rosenshine and Furst and the Dunkin and Biddle reviews as those which "have yielded the most significant and/or consistent results" (Rosenshine and Furst, 1973). Without careful examination of the definitions of these 14 variables it is difficult to compare the Berliner variables to variables from other studies. The study is unique in its use of ethnographic methodology as a way of generating variables that discriminate more-effective and less-effective teachers.

In summary, we can see that answers to the question of "What makes a good teacher?" have been sought in a variety of ways for some time now. The early years were dominated by Barr, and his students. Other important contributions were made by Lewin, Anderson and Withall. These researchers made both conceptual and methodological advances.

The modern era was dominated by both the work of Flanders and the development of over 300 classroom observation systems. Work in this modern era has been thoroughly reviewed by Rosenshine and Furst (1971) and Dunkin and Biddle (1974). These works focus on reporting an accumulation of data which led Dunkin and Biddle (1974) to conclude that there are now "scores of variables for describing classroom events . . . for which literally hundreds of suggestive findings have been developed!" (p. 418).

More recently the study of teaching has included:

1. attempts to test promising variables provided by the correlational work of the modern era (experimental studies by Gage

1976 and by Gall et al., 1976);

2. attempts to accumulate more process-product relationships in naturalistic settings (correlational studies by Brophy and Evertson, 1976; Soar, 1973; Stallings, 1976; Good and Grouws, 1975 and McDonald, 1976); and

3. attempts which assume that there is no conclusive process-product data and therefore sets out "to generate variables of promise in the study of teacher effectiveness" (Berliner, 1976b, p. 30), (an example of an ethnographic study of teaching effectiveness).

To conclude, a statement by Dunkin (1976) seems appropriate:

> . . . evidence that eventually might be forthcoming can only be probabilistic. Indeed, I am rather relieved that that is likely because the degree of prescriptiveness that might follow certainty of process-product relationships might be abhorrent. How then can increasing evidence of a probabilistic nature be useful in teacher education? First, it can be used to enhance teachers' abilities to conceptualize and therefore to analyse teaching behavior. Second, it should enhance teachers' abilities to hypothesize about the effects of their behavior. Third, it should provide teachers with more guidance than they have ever had to make decisions about how to behave towards pupils. Fourth, it can provide a basis for equipping teachers with behavioral repertoires needed to implement decisions they make (p. 185).

# Chapter III

## DESIGN AND PROCEDURES

The main purpose of this study was to investigate various components of classroom processes as they relate to pupil product measures. The investigation was limited by the assumptions stated in Chapter I and based upon the research evidence presented in Chapter II. The purpose of this chapter is: (1) to outline the design, the sample and the phases of the study, (2) to describe the sources of data and the training and data collection procedures, (3) to outline procedures for data analysis and (4) to make limitations and expectations explicit.

### 1. The Design, the Sample and the Phases of the Study

#### The Design

This study is part of a large scale descriptive-correlative study of teaching and learning. The data under study were therefore affected by the design of the larger study.

A survey of recommendations for improving research in teaching revealed some consensus on guidelines for further research. An attempt was made to consider the following guidelines in the design of the process-product part of the larger study.

1. Research on teaching should be undertaken in a naturalistic setting. This was interpreted to mean—in a classroom, where the teacher does what (s)he would normally be doing with the students

and the curriculum. Therefore control of curriculum objectives and materials, instructional setting and testing procedures, was of lower priority than ecological validity (Good, Biddle and Brophy, 1975).

2. Variables should be collected using existing, multifaceted coding instruments that capture a variety of both cognitive and affective interaction variables (Rosenshine and Furst, 1971; Flanders, 1974).

3. Both high-inference rating scales and low inference observation systems should be used to measure the same variables in the same investigation (Rosenshine and Furst, 1971; Glass, 1974; Good, Biddle and Brophy, 1975).

4. Coding instruments must capture the teacher-pupil dyadic relationship, as well as the teacher interacting with "the class-as-a-whole" (Peck, 1971; Good and Brophy, 1970; Bossert, 1976).

5. Enough data should be collected to enhance the possiblity of obtaining reliability and validity (Good, Biddle and Brophy, 1975).

6. A small number of teachers and classrooms should be studied to allow both extensive and intensive data collection, and both behavioral and introspective data collection (Brophy, personal conversation, Fall 1975; Shulman, personal conversation, Fall 1975).

7. A variety of student outcome measures should be obtained. These would include both in class coping behaviors, and achievement and attitudinal outcomes.

## The Sample

Six (6) teachers from two schools volunteered to participate in the study, one at each of the grade one, three and six levels in

both schools. Some difficulties were experienced in obtaining even this small number of participants. Approaches were initially made to three urban school boards. Typically, board office personnel would respond favorably and grant free access to most schools within their jurisdiction. Then contact with principals followed and there too the responses indicated interest and even "it should be done" reactions. But when the project was presented to teachers by the researchers and the teachers were assured that participation was to be voluntary, a variety of reasons for not volunteering were offered. We determined that some reasons for not participating that were given repeatedly were valid, namely, the time of the year (late spring) was inappropriate. Teachers that did show some interest in participating were those who had supervised student teachers, or had worked extensively on extra curricular activities and generally felt that they had had enough for one year ("I just want to complete the year with my class, uninterrupted").

We also hypothesized that the type of research that was being attempted, involving intensive in-class observation by "strangers" plus some videotaping of lessons was simply too threatening to some. Several teachers admitted that the intensive observation would make them nervous. They did not seem to be able to divorce observation and evaluation.

Presentations to groups of teachers were given in six schools (see Appendix A-1 for prepared handout). The last two schools visited were chosen as the sample for this study because the appropriate number of teachers at the desired grade levels volunteered.

The characteristics of the resulting sample were as follows:

1. The Schools

School 1 and School 2 were both located in an urban school district in Alberta. One of the schools had approximately 520 students in grades K through six. The other had approximately 459 students in grades K through six.

The timetables of the schools were virtually identical so that planning the collection of observational data was simplified.

2. The Teachers

The characteristics of the six teachers are presented in Table 5. A limited amount of data are presented to ensure anonymity.

TABLE 5

TEACHER DEMOGRAPHIC DATA

| Degree Held | Specialization | Years of Experience |
|---|---|---|
| BEd | Social Sciences | 17 |
| BEd | Early Childhood | 12 |
| BEd | Social Studies | 5 |
| BEd | Early Childhood | 1 |
| BEd | Business Education | 19 |
| BEd | Reading/English | 5 |

3. The Students

The characteristics of the resulting sample of 159 students are presented in Table 6.

TABLE 6

DISTRIBUTION OF STUDENT SAMPLE BY SEX AND GRADE

| | | Grade | | | |
|---|---|---|---|---|---|
| | | 1 | 3 | 6 | Totals |
| School | Boys | 14 | 12 | 19 | 45 |
| | Girls | 13 | 19 | 6 | 38 |
| School | Boys | 12 | 13 | 13 | 38 |
| | Girls | 10 | 15 | 13 | 38 |
| Totals | | 49 | 59 | 51 | 159 |

## The Phases in the Study

There were four distinct phases in the research project. The first or preparatory phase involved development of instruments and training in the use of these and others to be used in the research. Two schools not involved in the actual research project were used for training purposes. The second phase was the familiarization period when researchers spent time in the classrooms of the teachers that volunteered for the study proper. The third phase was the collection of process and product data.

### 1. The Preparatory Phase

The first phase of the study was a training period. The group of six researchers identified and divided the tasks related to data sources and collection. Three researchers were trained to use instruments for the collection of all the teacher process data. The other three researchers were trained to use instruments for the collection of pupil presage, process and product data. The duration of the training period was approximately three weeks and each team of three worked independently in the two training schools.

### 2. The Familiarization Phase

A familiarization period of one week was spent in the classrooms of the six teachers participating in the research project. One researcher trained to collect teacher process data was paired with one researcher trained to collect pupil data. Each pair of researchers was then assigned to a grade level and therefore had two classrooms each. The pairs spent alternate days in the two classrooms

during which time they did the following:

- arranged with the teachers to be introduced, or to introduce themselves, as visitors to the classroom with an interest in schools and classrooms. Every effort was made to ensure that students did not identify members of the research group with the authority structures of the school board, school, or classroom;
- became familiar with classroom routine;
- memorized the names of all the students in both grades, a prerequisite for intended use of the Brophy-Good low inference coding system. Student seating plans, with pictures, were made and used for the memorization task;
- practised using the high inference and low inference systems for coding classroom behavior.

Many other activities were also carried out during the familiarization phase. These related to data which were collected and analyzed by the other five members of the research team.

3. Data Collection Phase

Teacher Process Data. All teacher process data were collected in both schools within a period of two weeks, except in the case of one grade six teacher where, because of the teacher's absence, the data were collected in the first and third weeks after the period of familiarization in schools.

Five days were spent in each classroom over the two weeks. Research data were collected by each pair of investigators spending alternate days in the two classrooms for which they were responsible.

Two low inference systems (Expanded Brophy-Good System and the Curriculum Area Methods and Materials System)), and a set of eight high inference rating scales were used to describe classroom behavior of teachers. High inference ratings were made at periods other than those times when the low inference systems were used.

Guidelines adopted and used, where class schedules permitted, were:

i. Total period of recorded observation in classrooms— 10 hours in each of the grade one and three classrooms, 7 1/2 hours in both grade six classrooms.

ii. Observation of teacher behaviors was restricted to lessons in Language Arts and Mathematics at the first and third grade levels, and to Language Arts lessons in grade six.

iii. Time spent in observation in the two subject areas reflected the ratio of times allocated to Language Arts and Mathematics in the class timetable, approximately 3:1 respectively.

iv. Low inference and high inference coding occupied roughly four-fifths and one-fifth respectively of the total period of coded observation.

v. The duration of each period of high inference rating of teacher behavior was one-half hour. Each investigator also made an end-of-day rating for each day spent in the classroom.

vi. Recorded observations were made in morning and afternoon

sessions with both low and high inference systems.

Class timetables and unscheduled classroom events caused deviations from the guidelines. For example, no coding of Mathematics lessons occurred in some grades in the morning because this subject was taught only in the afternoon. Table 7 shows how periods of coded observation were spread over session, subject area, and method of data collection.

Pupil In-class Behavioral Data. The second member of the research pair coded pupil behaviors during the same periods listed in Table 7. Spaulding's Coping Analysis Schedule for Educational Settings (CASES) was used to collect data on each child. Data collection using CASES continued beyond the time shown in Table 7 in order to increase the number of observations per student. The CASES coders were therefore in the classrooms during the data collection phase more often than the teacher process coders.

Pupil Product Data. The pupil attitude and achievement tests were administered by the pairs of researchers during the weeks following the familiarization week and the three week process data collection phase. Each pair of researchers made arrangements with their two classroom teachers to administer the various tests when it was most convenient for the teacher and class. Testing was completed by the end of the school year. (See Figure 3 for summary schedule of the three phases.)

Table 7

Distribution of Actual Observation Periods[a] in Classrooms across Subject, Session, Grade, and Coding Method

| Observation Method | | Low Inference | | | | | | | | High Inference | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subject | | Language Arts | | | | Mathematics | | | | Language Arts | | | | Mathematics | | | |
| Time | | AM | | PM | | AM | | PM | | AM | | PM | | AM | | PM | |
| Session[b] | | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ | $S_1$ | $S_2$ | $S_3$ | $S_4$ |
| School 1 | Grade I | 3 | 8 | 1 | | | | 3 | | 2 | 1 | 1 | | | | 1 | |
| | III | 6 | 4 | | | | | 4 | | 2 | 2 | | | | | 1 | |
| | VI | 7 | 5 | | | | | | | 3 | | | | | | | |
| School 2 | Grade I | 5 | 7 | | | | | 3 | | 1 | 1 | 2 | | | | 1 | |
| | III | | 6 | 6 | | 3 | | | | | 2 | 2 | | 1 | | | |
| | VI | 6 | 6 | | | | | | | 1 | 2 | | | | | | |

[a] A period of observation is a half hour.

[b] Each day in both schools consists of four sessions:

| | |
|---|---|
| $S_1$ | 8:40 a.m. - 9:50 a.m. |
| $S_2$ | 10:05 a.m. - 11:15 a.m. |
| $S_3$ | 12:35 p.m. - 1:45 p.m. |
| $S_4$ | 2:00 p.m. - 3:10 p.m. |

FIGURE 3

SUMMARY OF THE FOUR PHASES OF THE STUDY

| Month | Phase | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|---|
| APRIL | 1 TRAINING | 5 Training on campus with manuals, lesson transcripts, and videotape | | | | |
| | | 12 Live coding in schools used for training | | | | |
| | | 19 Live coding in schools used for training | | | | |
| | | 26 Live coding in schools used for training | | | | |
| MAY | 2 FAMILIARIZATION | 3 Sch. 1 | Sch. 2 | Sch. 1 | Sch. 2 | Sch. 1 ---- Sch. 2 |
| | 3 DATA COLLECTION (OBSERVATIONS) | 10 Live coding | | | | |
| | | 17 Live coding | | | | |
| | | 24 Live coding | | | | |
| | 4 DATA COLLECTION (TESTING) | 31 Testing | | | | |
| JUNE | | 7 | | | | |
| | | 14 Re-testing | | | | |
| | | 21 Class and staff parties in each participating school | | | | |

## 2. Data Sources, Training and Data Collection Procedures

An outline of all the data sources for the larger study has been provided (see Figure 4). In Figure 4 the data sources for the process-product study under investigation have been underlined. Coding and rating sheets for the observation systems used may be found in Appendix B. Detailed descriptions of the instruments, training procedures and reliability data will be provided.

### High Inference Rating Scales

High inference rating scales were used to provide observer ratings on eight separate variables. Four of these variables or concepts were taken from the work of Kounin (1970). The Kounin concepts are as follows:

1. Withitness - the ability to communicate to pupils awareness of what is going on in the classroom, that is having eyes in the back of your head.
2. Overlappingness - the ability to deal with more than one matter in the classroom concurrently.
3. Smoothness - the ability to maintain the on going flow of academic events without giving attention to self-initiated intrusions.
4. Momentum - the ability to maintain the pace of the lesson without overdwelling and/or fragmentation.

The remaining four variables on which ratings of teachers were taken were:

# FIGURE 4

DATA SOURCES

| VARIABLES | SOURCES | DESCRIPTIONS |
|---|---|---|
| 1. Teacher Presage | 16 P.F. | - R. Cattell's 16 factor personality test |
| | T.I.B. | - O.J. Harvey's "This I Believe" test - reveals the teacher's belief system. |
| | M.T.A.I. | - Minnesota Teacher Attitude Inventory - reveals attitudes toward teaching and children |
| | Interview | - To determine the teacher's perception of class, educational goals, role of teacher, view of curriculum, expectations of students and certain demographic data |
| 2. Contextual a) Pupil presage | Parent questionnaire | - To determine parent attitudes toward education, expectations for their children and their educational background |
| | Student file | - 22 factors such as educational history, progress, family structure, information from which S.E.S. was established |
| | I.Q. Tests | - Peabody Picture Vocabulary test - for Gr. 1's.<br>Lorge-Thorndike Intelligence test - for Gr. 3 & 6 (verbal and non-verbal batteries) |
| | S.E.I. | - Coopersmith Self-Esteem Inventory (5 subscales) |
| | M.C.I. | - My Class Inventory (Walberg & Anderson) (5 subscales) |
| | S.A.Q. | - School Attitude Questionnaire (McCallon), general attitude to school, to student-instruction interaction and to teacher-pupil interpersonal relations |
| | Barker-Lunn | - Children's Attitude scales, Gr. 3 & 6, 10 subscales, e.g. attitude to school, class, school work, relationship with teacher, academic self-image, etc. |
| | Sociometic status | - Student's status within the class - reveals peer relationships |
| b) Classroom | Classroom inventory check list | - Physical and Instructional technology characteristics |
| c) School | Anecdotal records | - School environmental characteristics, e.g. no. and nature of spaces, pupils, staff, administration, and buildings |
| 3. Processes a) Teacher Behaviors | Rating scales | - High inference scales measuring withitness, overlappingness, smoothness, momentum, clarity, persuasiveness, warmth and empathy |
| | Dyadic-interaction coding system | - Expanded Brophy & Good Teacher-pupil dyadic interaction classroom observation system (98 low inference categories) |
| | Curriculum area, Methods & Materials coding system | - Developed by N. Moore and used by Brophy & Evertson (1976) 32 low inference categories focusing on teaching methods and materials used |
| | Anecdotal records | - End of day notes made by each of the coder researchers |
| | 12-45 min. VTRs | - 2-VTRs taken in each classroom in Language Arts and Math except Gr. 6 where both VTRs were in Language Arts |
| b) Pupil Behaviors | CASES - observation system | - R. Spaulding's Coping Analysis Schedule for Educational Settings (CASES) a 19 category system yielding 8 behavioral styles and an overall CASES coefficient |
| | Shadow technique | - Time sample anecdotal records of 6 randomly selected students (one from each class) to provide an account of "one day in the life of ..." a pupil in those classes |
| | Interviews | - Using the 6 shadowed pupils, attitudes toward class and perceptions of classroom activities were obtained |
| c) Teacher thought processes | 12 Stimulated-Recall interviews | - The two VTRs per teacher were used to reveal teacher's interactive thoughts, feelings and decisions |
| | 12 Pre-instructional interviews | - conducted prior to the VTR lessons to capture details of teacher lesson planning |
| | 18 Sort task interviews | - post lesson interviews to find out what teachers could recall of student behaviors during the lesson without the aid of the VTR stimulation<br>NOTE: (Stimulated Recall Interview protocols were developed from those used by Kagan and Shulman in medical inquiry and counsellor-training research; Teacher Sort Task Interview protocols used in the Beginning Teacher Evaluation Study at the Far West Laboratory for Educational Research and Development were adapted for use in this project) |
| 4. Product | M.R.T. (Gr. 1) | - Metropolitan Readiness test (Sept. 76 scores) |
| | M.A.T. (Gr. 3 & 6) | - Metropolitan Achievement tests (Sept. 76 scores and June 1976 scores for Grades 1, 3 & 6) |
| | S.A.T. (Gr. 6-S.S. | - Stanford Achievement S.S. subtest (June 1977 score) |
| | Report Card data | - Grades given by classroom teachers |
| | Teacher Rankings of students | - Expected achievement rankings and rankings based on teachers expectations for each student |
| | M.C.I. | - (See pupil presage) |
| | Barker-Lunn | |
| | T.I.B. | |
| | Other | - (See pupil behaviors) |

5. Clarity - as measured by a scale developed by Emmer (1972).
6. Persuasiveness - as measured by a scale developed from the concept of therapist persuasive potency (Truax et al., 1968).
7. Warmth - as measured by a scale adapted from Truax's scale of nonpossessive warmth (Truax, 1971).
8. Empathy - as measured by the Carkhuff revisions of the Truax scales for Empathic Understanding (Carkhuff, 1969). (See Appendix B for rating scales.)

Rater Training

Training consisted of approximately 12 hours of initial discussion for purposes of clarifying the meanings of variables. Practice in the use of the scales was then carried out in a school not used in the actual project. Three teachers each at a different grade level were used in five practices. Training continued until a criterion level of 80% agreement was reached.

Rating Procedures

Six ratings were taken on the first four management scales every two minutes. Then six ratings were taken on the remaining four scales every two minutes. The entire process took approximately one half hour or one class period. The six ratings of each of the two minute segments were averaged for each scale. These mean ratings were then used for reliability checks when two raters were present and later for obtaining the teacher's overall meaning rating to be used for data analysis. (See Appendix B for Rating Sheet used.)

Inter-Rater Reliability

Inter-rater reliability was calculated using percentage agreement among the three raters. Percentage agreement was calculated using this formula:

$$\text{Percentage agreement} = [(1 - \frac{R_H - R_L}{4}) \times 100]\%$$

where $R_H$ and $R_L$ are the highest and lowest ratings respectively on any one variable for any one period of observation, and 4 is the maximum difference possible on a five-point rating scale.

Intercoder reliability figures obtained during the training period are presented in Table 8. Reliability checks between pairs of raters were made during the data collection period. Altogether nine checks were carried out in five of the six classrooms. Results, indicated in Table 9, were regarded as generally satisfactory.

The Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

This is a comprehensive low-inference classroom observation instrument. It was designed to capture the naturally occurring sequences of teacher-student interaction in elementary classrooms as well as dyadic interactions between the teacher and a student. In addition, the instrument takes into account contextual differences and is based on real and psychologically meaningful units of classroom interaction (Brophy and Good, 1969, 1970; Brophy and Evertson, 1973). The authors report that it is possible to train coders to reach an 80% agreement criterion using a strict definition of agreement. For an outline of this system see Appendix B-3.

Training in the use of this low inference system involved

TABLE 8

INTER-RATER RELIABILITY MEASURES ON EIGHT HIGH INFERENCE RATING SCALES DURING TRAINING

| | Percentage Agreement | | | | |
|---|---|---|---|---|---|
| | Trial 1 | Trial 2 | Trial 3 | Trial 4 | Trial 5 |
| Variable | Teacher 1 | Teacher 1 | Teacher 2 | Teacher 3 | Teacher 1 |
| Withitness | 75.0 | 68.7 | 75.0 | 80.0 | 97.5 |
| Overlappingness | 85.0 | 75.0 | 75.0 | 70.0 | 82.5 |
| Smoothness | 87.5 | 80.0 | 50.0 | 80.0 | 97.5 |
| Momentum | 90.0 | 77.5 | 57.5 | 90.0 | 82.5 |
| Clarity | 92.5 | 75.0 | 80.0 | 85.0 | 87.5 |
| Persuasiveness | 100.0 | 77.5 | 85.0 | 57.5 | 97.5 |
| Warmth | 82.5 | 80.0 | 72.5 | 67.5 | 87.5 |
| Accurate Empathy | 80.0 | 85.0 | 87.5 | 100.0 | 87.5 |

TABLE 9

INTER-RATER RELIABILITY MEASURES ON EIGHT HIGH INFERENCE SCALES OBTAINED DURING DATA COLLECTION

| | School 1 | | | | | School 2 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Grade I | Grade I | Grade III | Grade III | Grade VI | Grade III | Grade III | Grade III | Grade VI |
| | Coders 1 & 3 | Coders 1 & 3 | Coders 2 & 3 | Coders 2 & 3 | Coders 1 & 3 | Coders 2 & 3 | Coders 2 & 3 | Coders 1 & 3 | Coders 2 & 3 |
| Variable | Day 3 | Day 6 | Day 5 | Day 9 | Day 8 | Day 8 | Day 10 | Day 10 | Day 8 |
| Withitness | 85.0 | 85.0 | 72.5 | -- | 90.0 | 87.5 | 70.0 | 70.0 | 82.5 |
| Overlappingness | 87.5 | 82.5 | 67.5 | -- | 100.0 | 82.5 | 72.5 | 92.5 | 100.0 |
| Smoothness | 97.5 | 87.5 | 70.0 | -- | 92.5 | 95.0 | 72.5 | 95.0 | 87.5 |
| Momentum | 92.5 | 87.5 | 55.0 | -- | 100.0 | 80.0 | 82.5 | 85.0 | 82.5 |
| Clarity | 92.5 | 75.0 | 62.5 | -- | 95.0 | 60.0 | 82.5 | 90.0 | 100.0 |
| Persuasiveness | 97.5 | 97.5 | 70.0 | 67.9 | 92.5 | 75.0 | 100.0 | 100.0 | 100.0 |
| Warmth | 87.5 | 92.5 | 72.5 | 90.0 | 90.0 | 97.5 | 92.5 | 100.0 | 95.0 |
| Accurate Empathy | 82.5 | 62.5 | 92.5 | 100.0 | 97.5 | 92.5 | 95.0 | 92.5 | 92.5 |

three coders and occupied a large proportion of the three-week intensive training period preceding the familiarization phase. The manual developed by the authors was used and general recommendations for training received in personal communication with J. Brophy were adopted. A grade 3-4 classroom, a grade 6 classroom and a grade 5 classroom were used for training purposes.

Initially some time was spent in discussing system categories and in practice coding from transcripts of lessons to provide a working knowledge of the system. Then training in the school classrooms began. The procedure adopted was that of spending short periods in the classrooms and then retiring to compare results.

A difficulty was encountered during the training period, namely, coders found that the task of recording observations directly to coding sheets interfered with efforts to capture the flow of classroom events. The problem was resolved by recording observations on audiotape as they occurred. Coders could thus keep their eyes constantly on events in the classroom and, at the same time, record coded classroom interactions.

This technique was used as unobtrusively as possible; it received no adverse comment from any teacher in either the school used for training purposes or those used in the research project itself.

Two modifications were made to the system during the training period. To the ten categories of teacher feedback reaction in academic response opportunities, two more were added:

1. affirmative teacher reaction (AFFIRM);

2. repeats student statement (REP SS).

These changes were effected by retaining nine of the ten original categories as defined in the original system and by dividing the *no feedback reaction* category into two parts, to allow finer distinctions to be made. (See Appendix B-3, Sec. II, page 204.)

Intercoder Reliability during Training. Reliability was calculated using a formula proposed by Brophy and Evertson (1973) which they claim is a more stringent method than is usually used. The formula is—

> Percentage agreement = number of coding decisions made by both coders and agreed upon divided by itself plus the number of coding decisions not agreed upon plus the number of codings made by the first coder but not the second plus number of codings made by the second coder but not the first.

An 80% agreement criterion was sought in training and was frequently achieved however it was not always possible to do so, the main factor contributing to this being the one noted also by Brophy and Evertson (1973) namely, the ". . . difficulty of 'catching everything' during bursts of activity . . ." (p. 11). The reliability measures tabled in Appendix C compare favourably with those reported by Brophy and Evertson.

Many of the results appearing in Appendix C are spuriously high (or low) because of the extremely low frequency of occurrence of some variables. For example, if a behavior occurs once only in a lesson and is coded by both observers, 100% agreement results. On the other hand, if one coder doesn't see the event then percentage

agreement is zero. For this reason, only percentage agreement results for variables with a frequency of occurrence of more than 10 are listed in Table 10 as examples of reliability measures achieved during training.

Intercoder Reliability during Data Collection. Because of the difficulty in achieving 80% agreement in all categories during training, it was deemed advisable to take reliability checks on each coder during data collection.

Intercoder reliability checks were conducted in each classroom and on occasions spanning the two week period of data collection where teacher and investigator schedules permitted. An effort was also made to do a reliability check in each classroom with the home room coder paired first with one of the two remaining coders and then with the other. This was achieved in four of the six classrooms. Thirteen separate checks were made with at least one check made in each classroom. These measures of intercoder reliability are reported in Appendix C. The same strict definition of agreement was used as discussed earlier. Only percentages of agreement for variables with frequencies over 10 are reported in Table 11 for reasons stated earlier. These results indicate a satisfactorily high level of agreement and are compared with the Brophy-Evertson (1973) figures.

## The Curriculum Area Methods and Materials Low Inference Observation System

The curriculum area methods and materials system included such teaching categories as time spent on review, presentation of material, practice and teacher evaluation etc. Methods categories included time

Table 10

Intercoder Reliability Measures Obtained with the Low Inference Classroom Observation System during Training

| Variable | % Reliability for Pairs of Coders (N=3) | Mean |
|---|---|---|
| Acad. resp. opportunity | | |
| Type of respondent | 82,80,82 | 81.3 |
| Question type | 73,30,36 | 46.3 |
| Child answer | 85,64,69 | 72.7 |
| Teacher feedback | 43,60,60 | 54.3 |
| Private dyadic contact | | |
| Type (CCC vs TAC) | 65,86,84,92,76,92 | 82.5 |
| Child created contact | | |
| Type (wk vs Pers) | 90,83,96,79,87,95 | 88.3 |
| Child created contact (wk.-rel.) | | |
| Teacher feedback (delay, brief, long) | 79,86,79,78,100,88 | 85.0 |
| Teacher afforded contact (wk.-rel.) | | |
| Teacher feedback (delay, brief, long) | 31,59,32 | 40.7 |
| Teacher feedback ($\overset{+}{+}$, $\overset{-}{-}$) | 33,100,33 | 55.3 |

TABLE 11

INTERCODER RELIABILITY MEASURES OBTAINED WITH THE EXPANDED BROPHY-GOOD DYADIC INTERACTION CLASSROOM OBSERVATION SYSTEM DURING DATA COLLECTION

| Variable | % Reliability Measures for Pairs of Coders | Mean | B & E, 1973* Median | Range |
|---|---|---|---|---|
| Acad. resp. opportunity | | | | |
| Type of respondent | 85,91,71,50,79 | 75.2 | 63 | 37-78 |
| Question type | 88,86,77,89,82,55,83 | 80.0 | 73 | 46-93 |
| Child answer | 85,90,75,52,89 | 78.2 | 70 | 52-86 |
| Teacher Feedback | 73,76,69,66,74 | 71.6 | 58 | 17-69 |
| Student initiated question | | | | |
| Teacher feedback | 60 | | 43 | 29-73 |
| Student initiated comment | | | | |
| Type | 50,71 | 60.5 | | |
| Relevancy | 44,75 | 59.5 | 53 | 38-83 |
| Teacher feedback | 44,57 | 55.5 | 43 | 25-78 |
| Private dyadic contact | | | | |
| Type (CCC vs TAC) | 84,73,73,56,83,89,56,85,88,83 | 77.0 | | |
| Child created contact | | | | |
| Type (wk vs Pers) | 62,69,80,81,80 | 74.4 | | |
| Teacher feedback | 41,71,75,79,67 | 66.6 | | |
| Teacher afforded contact | | | | |
| Type (Per vs Wk vs Proc vs Bch) | 76,74,67,43,85,77,90,55 | 70.9 | | |
| Teacher afforded contact (wk.-rel.) | | | | |
| Teacher feedback (obs vs Br vs Lo) | 67,83 | 75.0 | | |
| Teacher afforded contact (proc.-rel.) (Man vs Fav.) | 50,100,89,22,100,88 | 74.8 | | |

*Intercoder Reliability Measures reported by Brophy and Evertson, 1973.

spent on demonstrations, lecturing, focused discussion, drill, etc. Materials categories included identifying type of materials in use, for example, standardized, teacher created, media, games etc. The system also includes coding the degree of individualization in that it captures the time that teacher behaviors are directed toward an individual, small groups or the class-as-a-whole. (See Appendix B for coding sheet.)

This low inference coding system was developed by Nancy Moore and used in the first phase of the Correlates of Effective Teaching Project (Brophy and Evertson, 1973).

Time and logistics did not permit taking reliability checks on the use of this instrument. The categories are such that the coders experienced little or no difficulty in agreeing on operational definitions provided in the manual or in the use of the instrument in the classroom.

Product Data

Pupil Behaviors

1. CASES

Spaulding's Coping Analysis Schedule for Educational Settings (CASES) was used to collect data on each child. The data provide important "nonachievement" (Bossert, 1976, p. 9) effectiveness criteria.

Coping behavior has been defined as "actively confronting problems, showing independent initiative in seeking solutions and displaying persistent effort to arrive at solutions" (Peck, 1971,

p. 89). The CASES instrument was designed to identify 13 basic categories of coping behaviors. Spaulding (1973) explains the development and content of CASES as follows:

> Basic to its development were the concepts of "integrative" and "dominative" social behavior as delineated in the work of H. H. Anderson. In addition to generally "active" and "passive" styles of child response to environmental stimuli, CASES includes categories which reflect "overt aggression," "passive aggression," "independence," "autonomy," "dependence," "avoidance," and "withdrawal" (p. 1).

(See Appendix B for CASES short form and methods for calculating styles.)

By creating combinations of the category frequencies, it is possible to produce coefficients representing "styles" of coping behaviors as well as an overall CASES coefficient (OCC). The styles are:

Style A - Aggressive, annoying, bothering, dominative, controlling, manipulative.

Style B - Inappropriately self directed or socially active, peer-oriented, talkative, resistant to authority, delaying, non-conforming.

Style C - Passive, withdrawn, fearful, avoidant.

Style D - Peer dependent, peer observant, distractible.

Style E - Compliant, dependable, studious, conforming, adult-dependent.

Style F - Social, assertive, integrative.

Style G - Independent, productive, self-directed, non-social.

Style H - Other-directed, conforming to authority, task-oriented when supervised.

The visibility thresholds for each style were empirically developed so that a coefficient of 1.00, considered to reflect a dominant or visible behavior pattern, represents a point one standard deviation above the mean obtained for each style in a sample of approximately

2,700 pupils in grades 1 through 12. Styles A to F are typically found as unipolar dimensions in factor analyses, whereas Styles G and H are predominantly opposite poles of a single factor.
The OCC is a weighted ordinal scale to measure the student's overall success in coping with the educational setting—the higher the score (on a range of from 1 to 10), the more successful the student.

Inter-rater reliability is typically reported to range from the mid .80's to the mid .90's. "Construct validity is suggested by the ease with which teachers and others familiar with child development and personality theory have obtained reliability of observation and recording" (Spaulding, 1973, p. 4).

H. H. Anderson's concepts of "integrative" and "dominative" teacher behaviors reflects the distinction Spaulding makes between teacher directed (T.D.) and non-teacher-directed (N-T.D.) settings. Accordingly, children exhibit more conforming behaviors and less spontaneity and initiation in T.D. than N-T.D. settings. Consequently, data are collected and combined separately for each of these two settings.

The CASES data will be used to determine the effects of specific teaching behaviors and processes. Bossert (1976) has recently written, "research on schooling has consistently ignored non-achievement outcomes . . . [such] as the learning of cooperation, competition, independence and self-direction, and the development of moral autonomy in children" (p. 9).

CASES Training and Reliability Measures. Training in the use of the CASES observation system involved a week of study and coding

using a training manual and a training videotape obtained from R. Spaulding. The videotape consists of two junior high school students and a sound signal every 10 seconds so that approximately 56 tallies could be made on each subject. The manual contained the signal number and a behavioral specimen description which was coded in the appropriate CASES category. These protocols were provided for both boys on the videotape. The three researchers involved attained an average inter-rater reliability (percentage agreement) of 88.79% on the final check of both subjects. Percentage agreement was computed using the following formula:

$$\frac{\text{No. of agreements}}{\text{No. of agreements + No. of disagreements}} \times 100\%$$

(see Table 12).

Training continued in a school setting where inter-rater reliability for pairs of observers ranged from 31.82% to 92.00% with a mean of 65.61% (see Table 13). When reliability was calculated among the three observers, the mean value was 78.28%. Reliability during training in the live setting was improved by each coder coding on a sound signal emitted through audiotape to earphones at 10 second intervals. This served to more accurately standardize the time at which pupil behaviors were coded.

During the collection of process data six students were observed at a time in rotation and behaviors were continuously coded until approximately 40 tallies per student were obtained. Each data sheet contained the date, time, school and grade, academic subject, setting (T.D. or N-T.D.), and length of time in which coding occurred. To minimize the possible loss in accuracy which

TABLE 12

CASES RELIABILITY MEASURES—PERCENTAGE AGREEMENT OF THREE CODERS WITH THE TRAINING VIDEOTAPE PROTOCOLS

| Test No. | Subject | Coders A | B | C | |
|---|---|---|---|---|---|
| 1 | Fred | 80.77 | 73.08 | 65.38 | |
| 2 | Wayne | 51.02 | 46.15 | 63.27 | |
| 3 | Fred | 80.77 | 80.77 | 69.23 | |
| 4 | Wayne | 71.43 | 53.06 | 67.35 | |
| 5 | Fred | 88.46 | 78.85 | 73.08 | |
| 6 | Wayne | 79.59 | 75.51 | 71.43 | |
| 7 | Fred | 96.15 | 88.46 | 80.77 | |
| 8 | Wayne | 95.92 | 83.67 | 87.76 | |
| | | $\bar{x}$ 80.51 | $\bar{x}$ 72.44 | $\bar{x}$ 72.28 | Grand $\bar{x}$ 75.08 |

TABLE 13

CASES RELIABILITY MEASURES TAKEN IN CLASSROOMS—PERCENTAGE AGREEMENT BETWEEN CODERS DURING TRAINING

| Test No. | Grade | Setting | Coders A & B | A & C | B & C | ABC |
|---|---|---|---|---|---|---|
| 1 | 6 | N-T.D. | 66.67 | 56.86 | 70.59 | 71.33 |
| 2 | 6 | T.D. | 52.94 | 58.82 | 49.02 | 80.67 |
| 3 | 6 | T.D.&N-T.D. | 66.00 | 74.00 | 78.00 | 80.67 |
| 4 | 6 | N-T.D. | 64.00 | 66.00 | 80.00 | 79.33 |
| 5 | 6 | T.D.&N-T.D. | 77.27 | 31.82 | 31.82 | 63.89 |
| 6 | 6 | N-T.D. | 33.33 | 60.78 | 35.29 | 66.67 |
| 7 | 6 | N-T.D. | 90.20 | 88.24 | 88.24 | 93.33 |
| 8 | 6 | N-T.D. | 76.00 | 76.00 | 70.00 | 86.67 |
| 9 | 2 | N-T.D. | 55.10 | 65.31 | 53.06 | 68.00 |
| 10 | 2 | T.D. | 54.00 | 58.00 | 64.00 | 68.00 |
| 11 | 6 | N-T.D. | 35.90 | 46.15 | 48.72 | 48.00 |
| 12 | 6 | N-T.D. | 92.00 | 82.00 | 84.00 | 92.00 |
| 13 | 6 | N-T.D. | 82.00 | 90.00 | 82.00 | 91.33 |
| 14 | 2 | N-T.D. | 50.00 | 46.00 | 56.00 | 66.67 |
| 15 | 2 | N-T.D. | 66.00 | 72.00 | 62.00 | 81.33 |
| 16 | 2 | T.D. | 62.00 | 52.00 | 50.00 | 76.00 |
| 17 | 6 | N-T.D. | 77.78 | 88.89 | 88.89 | 86.67 |
| 18 | 6 | T.D. | 80.00 | 90.00 | 74.00 | 85.33 |
| 19 | 6 | T.D. | 48.00 | 50.00 | 74.00 | 73.33 |
| 20 | 6 | T.D. | 66.67 | 54.55 | 48.48 | 74.74 |
| 21 | 6 | N-T.D. | 80.00 | 74.00 | 78.00 | 86.67 |
| 22 | 6 | N-T.D. | 74.00 | 70.00 | 70.00 | 80.00 |
| 23 | 2 | T.D. | 72.00 | 64.00 | 66.00 | 82.00 |
| 24 | 2 | T.D. | 58.00 | 66.00 | 56.00 | 78.00 |
| 25 | 2 | T.D. | 68.00 | 70.00 | 68.00 | 78.67 |
| 26 | 2 | T.D. | 58.82 | 61.76 | 52.94 | 76.76 |
| 27 | 6 | N-T.D. | 74.00 | 72.00 | 74.00 | 86.00 |
| 28 | 6 | N-T.D. | 62.00 | 70.00 | 68.00 | 81.33 |
| 29 | 6 | N-T.D. | 48.00 | 60.00 | 56.00 | 72.67 |
| 30 | 6 | N-T.D. | 62.00 | 68.00 | 70.00 | 88.51 |
| 31 | 6 | T.D. | 74.00 | 64.00 | 70.00 | 78.47 |
| 32 | 6 | T.D. | 78.00 | 78.00 | 72.00 | 80.00 |
| 33 | 6 | T.D. | 66.00 | 66.00 | 76.00 | 84.00 |
| 34 | 6 | T.D. | 60.87 | 52.17 | 54.34 | 80.67 |
| 35 | 6 | N-T.D. | 71.79 | 43.59 | 48.72 | 71.92 |
| 36 | 6 | T.D.&N-T.D. | 86.00 | 88.00 | 88.00 | 96.67 |
| | | $\Sigma$ | 2389.34 | 2374.94 | 2356.11 | 2836.30 |
| | | $\bar{x}$ | 66.37 | 65.97 | 65.45 | 78.79 |
| | | Range | 33.33-92.00 | 31.82-90.00 | 31.82-88.89 | 63.89-96.67 |
| | | Average of paired means | 65.93 | | | |

Reid (1970) noted when observers thought they were not being monitored, periodic reliability checks were made at each grade level. The nine checks resulted in an average inter-rater reliability agreement of 77.22 percent (see Table 14). In addition, five more trials were conducted with the training tape, resulting in an average agreement of 89.85 percent (see Table 15).

2. Absenteeism and Number of Discipline Visits to Office

The number of days that each student was absent or was sent to the office for disciplinary action was recorded and used as "circumstantial evidence" (Mager, 1968) for inferring a positive or negative attitude toward school (see Stallings, J., 1976).

Pupil Achievement

Somewhat more distant from the actual teaching behaviors in class are more global pupil outcomes of achievement and attitudes.

1. Metropolitan Achievement Tests

It was decided that measures of the Metropolitan Achievement Tests (MAT) would be used as one effectiveness criterion. The tests were used extensively throughout the school district for each grade in the fall of each year. Teachers and students were familiar with such tests and further they were accepted by the participating teachers as having content validity.

The MAT test forms used were the Primary I Form F, Elementary Form F, and Intermediate Form G in grades one, three and six respectively. Spearman Brown split-half reliability coefficients and Kuder-Richardson Formula 20 reliability estimates are reported to

TABLE 14

CASES RELIABILITY MEASURES—PERCENTAGE AGREEMENT BETWEEN CODERS WITH SAMPLE STUDENTS DURING DATA COLLECTION

| Test No. | Grade | Setting | Coders A & B | Coders B & C |
|---|---|---|---|---|
| 1 | 1 | T.D. | 68.00 | -- |
| 2 | 1 | N-T.D. | 88.00 | -- |
| 3 | 6 | T.D. | -- | 74.00 |
| 4 | 6 | N-T.D. | -- | 80.00 |
| 5 | 3 | T.D. | -- | 63.00 |
| 6 | 3 | N-T.D. | -- | 82.00 |
| 7 | 3 | T.D. | -- | 88.00 |
| 8 | 1 | T.D. | 78.00 | -- |
| 9 | 1 | N-T.D. | 74.00 | -- |
| | | | $\bar{x}$ = 77.00 | $\bar{x}$ = 77.40 |

Grand $\bar{x}$ = 77.22

TABLE 15

CASES RELIABILITY MEASURES TAKEN DURING DATA COLLECTION—
PERCENTAGE AGREEMENT OF THREE CODERS WITH THE
TRAINING VIDEOTAPE PROTOCOLS

| Test No. | Subject | Coders A | B | C | |
|---|---|---|---|---|---|
| 1 | Fred | 96.15 | 94.23 | 96.15 | |
| 2 | Wayne | 87.76 | 91.84 | 83.67 | |
| 3 | Fred | 96.15 | 94.23 | 71.15 | |
| 4 | Fred | 94.23 | 90.38 | 86.54 | |
| 5 | Wayne | 83.67 | 89.80 | 91.84 | |
| | | $\bar{x}$ = 91.59 | $\bar{x}$ = 92.10 | $\bar{x}$ = 85.87 | Grand $\bar{x}$ = 89.85 |

range from .88 to .96 and from .91 to .97 respectively for the sub-tests used in this study. The tests were administered by the researchers to grades one, three and six for Language Arts and to grades one and three for Mathematics. As no Mathematics lessons were observed at the grade six level no Mathematics tests were administered to the grade six students.

2. Report Cards

It also seemed important to look at report card scores given to students which were based primarily on teacher made tests, or tests more closely associated with the curriculum materials in use. The June report cards which were used in this study include performance skills development and academic achievement grades. The performance skills development refers to the student's performance as a group member (four subskills), performance as an individual (four subskills), and skills for working (three component skills). Academic achievement grades included subject grades for effort (the degree to which each student approached his potential) and achievement (progress in achieving the established goals and objectives of the subject program).

Academic grades used in this study were Language Arts (six component skills) and Mathematics. All grades were on a four point ordinal scale and were assumed to have greater content validity than the scores obtained from the standardized tests.

3. Teacher Rankings

Because of the limited variance in scores provided by the report card data, teachers were asked to rank their students with respect to both achievement and effort (see Appendix D). For the rankings according to effort, teachers were asked to state whether the student had greatly exceeded expectations (G), exceeded expectations (E), met expectations (M), fell below expectations (B) or fell far below expectations (F).

Pupil-Attitudes

Pupil attitudes will be defined as measures on four standardized tests.

1. Children's Attitude Scale

The Children's Attitude Scale (Barker Lunn, 1966) is a 64 item questionnaire developed for use with nine to eleven year old children. Subscales were derived empirically and are made up of 6-10 statements, "expressed in the language of children" (Barker Lunn, 1971) and selected after factor and scalogram analyses. The 10 subscales are as follows:

1. Attitude to school
2. Interest in school work
3. Importance of doing well at school
4. Attitude to class
5. 'Other' image of class
6. Conforming versus non-conforming pupil
7. Relationship with teacher

8. Anxiety in the classroom situation
9. Social adjustment—getting on well with classmates
10. Academic self-image.

2. My Class Inventory (MCI) (Anderson, 1973)

The MCI is a 45 item forced-choice questionnaire with five subscales:

1. Satisfaction
2. Friction
3. Competitiveness
4. Difficulty of work
5. Cohesiveness.

The author's test-retest reliability measures and those calculated for this study are reported in Table 16.

3. School Attitude Test (SAT) (McCallon, 1973)

The SAT is designed to elicit a response from the pupil which will be representative of his attitude toward his school environment and educational experiences. The test is designed to provide insight into the following dimensions:

1. Interpersonal relations
2. Student instruction interaction
3. General school factor.

Two forms of the SAT were used, the Oral Version, a 29 item questionnaire used for grades one and three, and the Written Version, a 46 item questionnaire used for grade six. The author' test-retest reliability measures and those calculated for this study are reported

TABLE 16

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN TEST-RETEST SCORES ON THE MCI

| Grade | N | Subscales 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 1, 3 & 6 | 69 | .63 | .61 | .59 | .70 | .53 |
| 1 | 21 | .34 | .60 | .64 | .53 | .47 |
| 3 | 22 | .73 | .51 | .51 | .76 | .25 |
| 6 | 26 | .65 | .74 | .50 | .78 | .71 |
| 3 & 6 | 48 | .69 | .63 | .57 | .75 | .50 |
| Anderson Reliabilities | | | | | | |
| 3 & 6 | 655 | .77 | .70 | .56 | .56 | .54 |

in Table 17.

4. Coopersmith Self-Esteem Inventory (Coopersmith, 1974)

The Coopersmith Self-Esteem Inventory is a 58 item questionnaire which yields scores on five subscales. They are:

1. General self-esteem
2. Social self-esteem (peers)
3. Home self-esteem (parents)
4. Lie scale
5. School self-esteem (academic)

The author's test-retest reliability measures and those calculated for this study are reported in Table 18.

## 3. Data Analysis

This research project may be described as a descriptive-correlational study, the main purpose being to investigate various components of classroom processes as they relate to pupil product measures. Prior to subjecting specific data to correlational analysis, much of the raw data of teacher classroom processes, pupil classroom processes (or non-achievement outcomes) and measures of pupil achievement and attitude, were presented through the medium of figures and tables. This was done to provide a clear and comprehensive description of the six classrooms under study.

### Data Preparation—Teacher Process Data

The Expanded Brophy Good Teacher-Pupil Dyadic Interaction Observation System yields more than frequency counts in the 98

TABLE 17

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN TEST-RETEST SCORES ON THE SAT

| Grade | Form | N | R |
|---|---|---|---|
| 1 | Oral | 21 | .68 |
| 3 | Oral | 21 | .73 |
| 1 & 3 | Oral | 42 | .70 |
| Author's reliability | | | |
| 1 & 3 | Oral | | .77 |
| 6 | Written | | .78 |

TABLE 18

PEARSON PRODUCT MOMENT CORRELATIONS BETWEEN TEST-RETEST SCORES ON THE COOPERSMITH SELF-ESTEEM INVENTORY

| Grade | N | R |
|---|---|---|
| 1 | 24 | .79 |
| 1 & 3 | 51 | .87 |
| 1, 3 & 6 | 75 | .84 |
| Author's Reliability | | |
| 1, 3 & 6 | | .88 |

categories. It is possible to maintain the sequence of classroom events thus allowing a more complex description of teacher-pupil interaction for each pupil.

The first step in describing the teacher-pupil interaction styles was to outline all possible sequential patterns. For example, categories in the Academic Response Opportunities consist of four ways of selecting who will respond, three question types, five possibilities in terms of the answer given by the child, and thirteen teacher feedback types. One hundred and fifty-five (155) types of academic response opportunities (sequential patterns) were outlined and used to categorize the raw data. In all 256 different subcategories were used in transferring the raw data. (See Figure 5 for an example of how the raw data were transferred to secondary coding sheets.)

Once all the raw data had been transferred to the secondary coding sheets it was possible to calculate:

1. The frequencies and proportions of teaching behaviors observed; and
2. The frequencies and proportions of types of interactions afforded each pupil.

Note: Brophy (1976c) has stated:

> Simple frequency counts of classroom processes are not very useful. They should be replaced with percentage scores or other scores that combine frequencies with information about opportunities or expected frequencies for particular interactions. For example, a measure of the frequency of praise of correct answers is less useful than a measure of the percentage of correct answers which were praised (p. 20).

Pupil absenteeism during observation periods necessitated data

FIGURE 5

TRANSFERENCE OF RAW DATA TO SECONDARY CODING SHEETS
RAW DATA AS COLLECTED FROM THE CLASSROOM*

ACADEMIC RESPONSE OPPORTUNITIES

| Child | | | | Quest | | | Answer | | | | Terminal Feedback | | | | | | | | | Sustain Feedback | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PRE | NVOL | VOL | CALL | PCSS | PROD | CHOIS | + | + | - | DK | NR | + | + | - | O | APF | PCSS | GIVAN | ASKO | CALL | R Q | R C | N Q | R S S |
| | 6 | | | | ✓ | | ✓ | | | | | | | | | ✓ | | | | | | | | |
| | 7 | | | ✓ | | | | ✓ | | | | | | | | | | | ✓ | | | | | |
| 8 | | | | | ✓ | | | | ✓ | | | | | | | | | | | | | ✓ | | |
| | 8 | | | | ✓ | | ✓ | | | | | ✓ | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | (Total - 98 categories) | | | | |

RAW DATA CODED ON TO SECONDARY CODING SHEET

| Pupil | PRE PROD − R̄C̄C | NVOL PCSS ± AskO | NVOL PROD + + + | VOL PROD + AFF |
|---|---|---|---|---|
| 6 | | | | 1 |
| 7 | | 1 | | |
| 8 | 1 | | 1 | |
| . . . | | | | |

SECONDARY CODING SHEETS—MAINTAINING SEQUENTIAL PATTERNS

| Pupil | PRE PCSS + ‡ O AFF NQ RSS | PRE PCSS ± ‡ O AFF PCSS ASK CALL RQ R̄C̄C NQ RSS | PRE PCSS − O RCSS ASK CALL RQ RcC NQ RSS etc.... |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| . . . | | | (Total - 256 subcategories) |

*Sample shows only a portion of the 98 category coding sheet.

adjustment for time. The adjustment procedure involved multiplying the frequency variable by the proportion of the total observation time during which each pupil was present. For example, if a pupil was in attendance for 75 of 100 observation minutes, his score on each frequency variable was multiplied by 1.25. This procedure was considered appropriate since observations were spaced over a period of two weeks and it was concluded that there were few systematic differences in the nature of classroom activity between observation periods.

## 4. Limitations and Expectations

### Limitations

The field conditions of this study, that is, being set in real classrooms with working teachers and their students, imposed certain limitations.

1. The sample of schools and teachers was small.
2. Contextual variables, particularly curriculum content, were not standardized.
3. The number of Mathematics lessons observed was particularly few in number, this being determined by the amount of time given to the teaching of Mathematics in each school.
4. Observer time hours required to determine changes in or stability of teacher-pupil interaction patterns and pupil coping styles were not available.

These limitations are such that the study will have limited generalizability.

Expectations

We must remain aware of the possibility that teaching and learning may be so ideosyncratic that finding a set or sets of effective procedures may never happen (Rosenshine and Furst, 1971). It is expected that some teaching styles or patterns of teacher behaviors will be found which are correlates of pupil outcomes. One may rightly ask, "Why such optimism when the researcher's path is cluttered with failures, with conflicting evidence and with inconsistencies?" The multi-dimensional nature of the data collected for analysis in this study gives reason for optimism. The reader is reminded of the problems of instrumentation, methodology and statistics mentioned in Chapter I of this paper. An attempt has been made to examine and overcome some, though not all, of the "Impediments to the Study of Teaching" (Berliner, 1976a, p. 5).

# Chapter IV

## RESULTS: REPORTED AND DISCUSSED

### Introduction

The results related to the questions posed in Chapter I are presented through the medium of figures and tables. To review, the questions are as follows:

1. What are the detailed interaction sequences of each teacher as described by the Expanded Brophy-Good teacher-pupil dyadic interaction observation system (hereafter B and E)? Figures 6 and 7* in the set for teacher and class 1 give all the proportions of public and private interaction sequences in language arts. Figure 8 is a summary of Figures 6 and 7 in that it presents only the main interaction sequences used by the teacher in language arts.

Figures 9, 10, and 11 present proportions of all public and private interaction sequences and the main interaction sequences respectively, used by the teacher in mathematics.

2. What amounts of the teacher's main interaction sequences are afforded high achievers and low achievers? Table 19 provides a list of 23 variables. The list was derived from the summary figures for the six teachers outlining the main interaction sequences. The

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*Note: Normally the reader would expect to find Figures 6 and 7 on the next page. In this instance the entire set of figures and tables for teacher and class 1 will be described as an example of how the data will be presented. Each set of figures and tables will be inserted in close proximity to the discussion of the results by teacher and by class.

variables were chosen, therefore, on the basis of what occurred most often in each classroom. The frequencies of interactions afforded high and low achievers as measured by the MAT Total Reading subscale are provided in Table 19.

3. What relationship exists between the main interaction sequences and other B and E process variables and pupil behaviors, achievement and attitudes? Tables 20, 21, and 22 provide data showing relationships between selected process and product variables. Table 20 provides rank orders of each child in class 1 on a number of process and product measures. Table 21 provides correlational data between teacher B and E process variables and the pupil product measures. Table 22 contains correlations between B and E process variables and pupil behavioral styles (CASES data). Tables E-1 to E-6 giving each student's behavioral styles coefficients may be found in Appendix E.

4. What is the relationship between variables derived from the curriculum area methods and materials low inference observation system and product measures? This question will not be answered. It was noted in Chapter III that time and logistics did not permit taking reliability checks on the use of this observation system. It was found that discrepancies in coding procedures rendered the data inaccurate for purposes of analysis.

5. Questions 5, 6, and 7, in summary are: What are the relationships between mean ratings of teacher classroom management, interpersonal and instructional skills and pupil product measures? The ratings for the six teachers are presented in Table 43. The relationships between ratings and product measures are shown in

Table 44 and appear following the discussions of results for the six teachers.

In summary, data for each teacher and class are presented in a set of figures and tables identical to those described for teacher 1 and class 1.

Language Arts (All grades)

1. Figure 6 - Public interactions - proportions and sequences.
2. Figure 7 - Private interactions - proportions and sequences.
3. Figure 8 - Main interaction sequences used by the teacher.

Mathematics (For Grades 1 and 3)

4. Figure 9 - Public interactions - proportions and sequences.
5. Figure 10 - Private interactions - proportions and sequences.
6. Figure 11 - Main interaction sequences used by the teacher.

Language Arts

7. Table 19 - Frequency of main interaction process variables afforded high and low achievers.
8. Table 20 - Students rank ordered by process and product variables.
9. Table 21 - Correlations - B and E teacher process variables and selected pupil product measures.
10. Table 22 - Correlations - B and E teacher process variables and pupil behavioral styles.
11. Table E-1 - Behavioral styles coefficients A to H for each student in both teacher directed and non-teacher directed settings (Appendix E).

## Teacher 1 and Class 1 - Grade 1

The results for teacher 1 and class 1 are reported in Figures 6 to 11 and Tables 19 to 22.*

Figures 6 to 11

a. Private Interactions (.85 in language arts and .94 in mathematics)

Examination of the main interaction sequences portrays a picture of the classroom as a hive of work activities. Children were working individually or in small groups with the teacher moving busily from group to group and individual to individual. The teachers main concern was with evaluating the work that the children were doing. The higher proportion of student initiated private interactions is explained by the number of children who followed the teacher around with their work in hand seeking feedback.

The long attention given by the teacher to individual children resulted in a mid-range rating in overlappingness. The children therefore often had to wait and sometimes became restless. This resulted in teacher initiated behavior warnings becoming one of the main interaction sequences used by the teacher.

b. Public Interactions (.15 in language arts and .06 in mathematics)

Public interactions, when they did occur, were dominated by

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*To supplement the results reported in the figures and tables, reference will be made to anecdotal records kept by each pair of coders and to teacher interview data (see Appendix F for interview schedules).

FIGURE 6

TEACHER NO. 1 IN LANGUAGE ARTS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—156 OF 1048

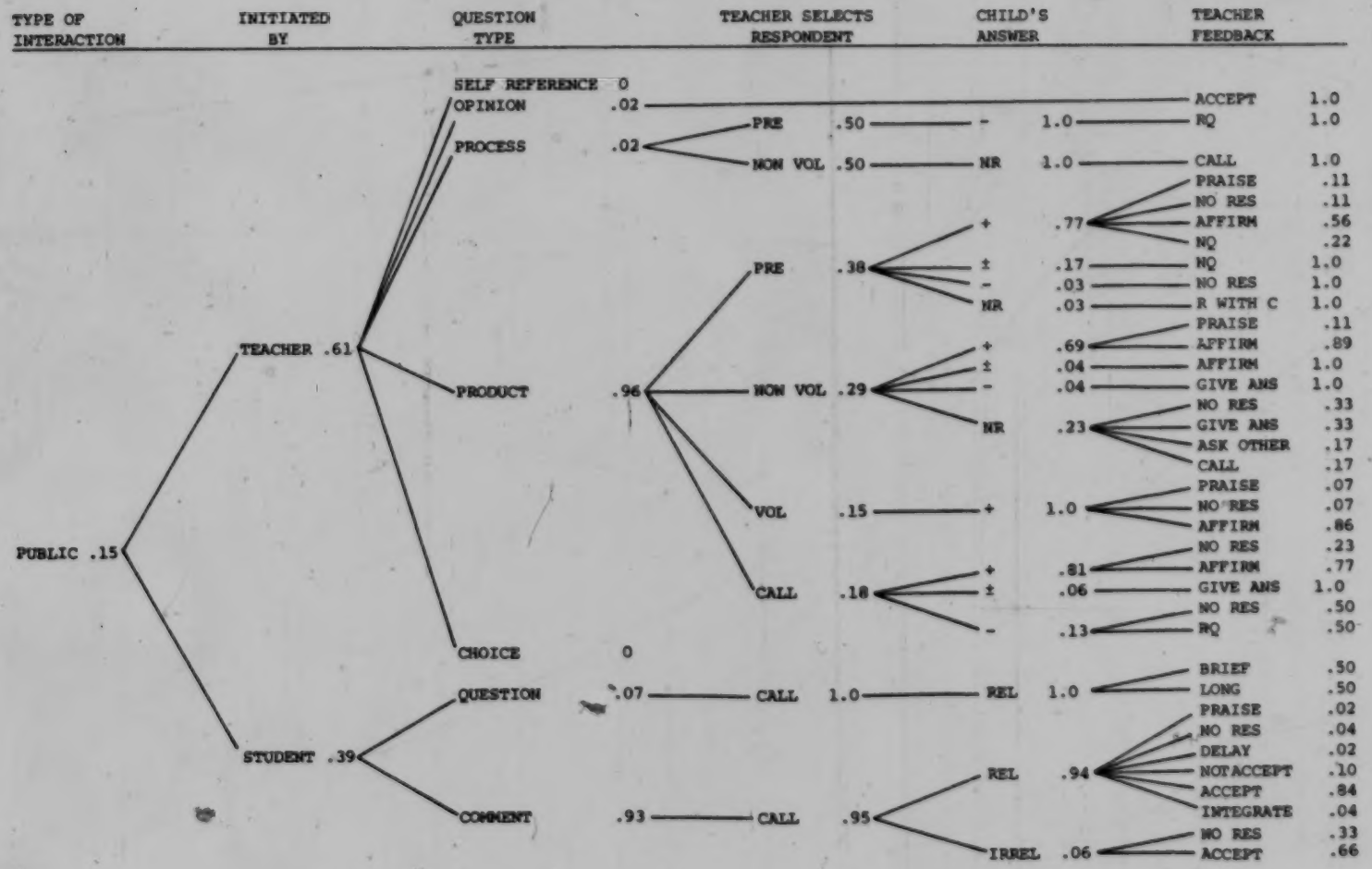


FIGURE 7

TEACHER NO. 1 IN LANGUAGE ARTS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—892 OF 1048

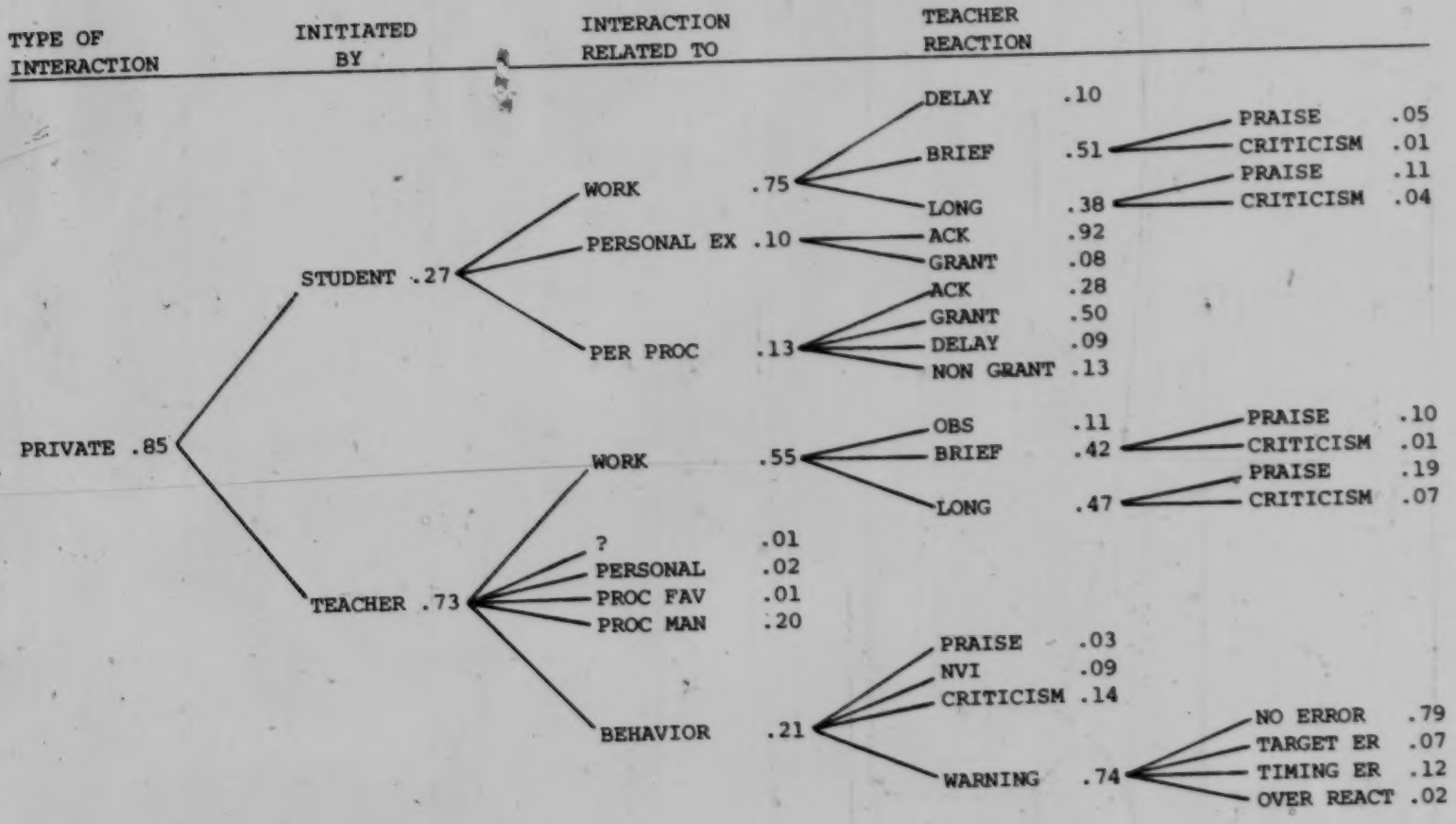


FIGURE 8

TEACHER NO. 1—PROPORTION OF MAIN INTERACTION SEQUENCES IN LANGUAGE ARTS

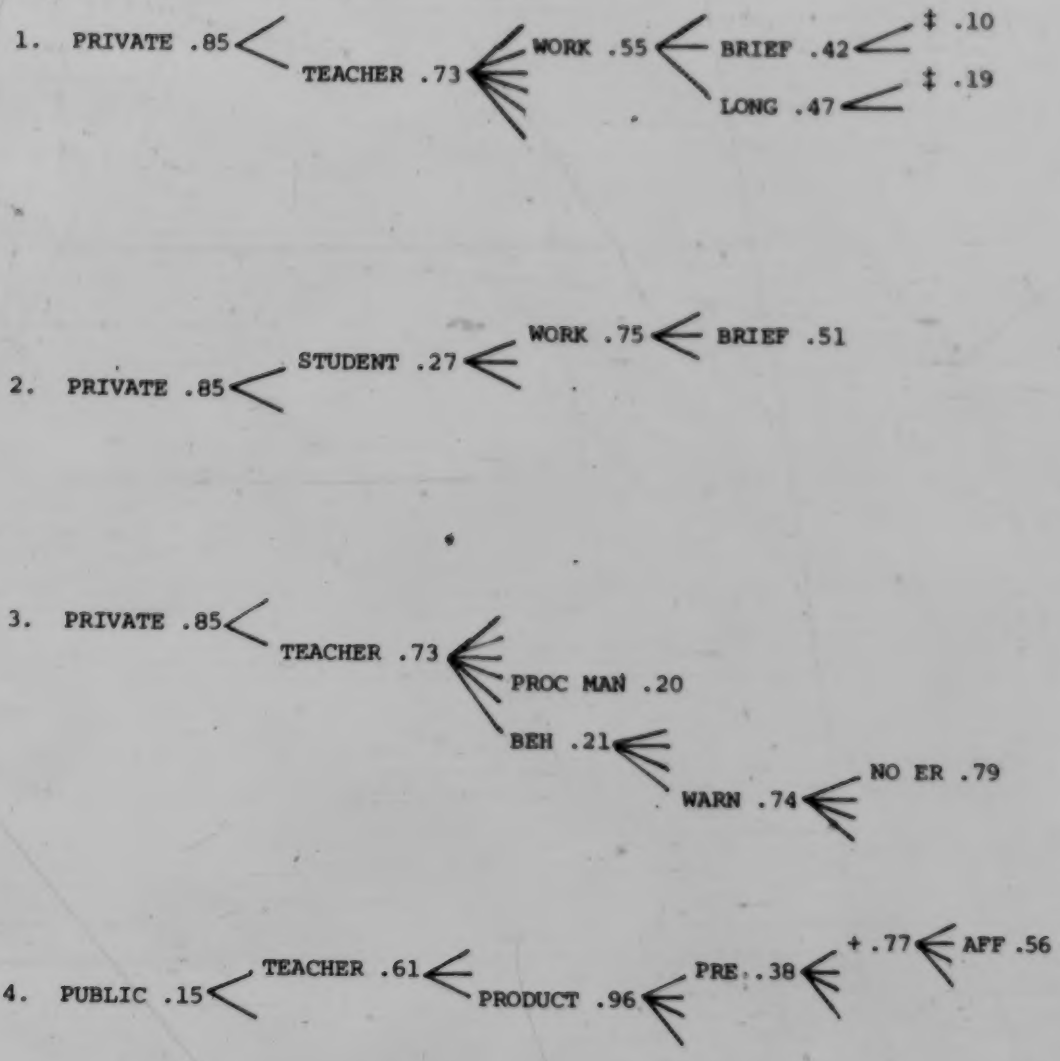


FIGURE 9

TEACHER NO. 1 IN MATHS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—21 OF 353

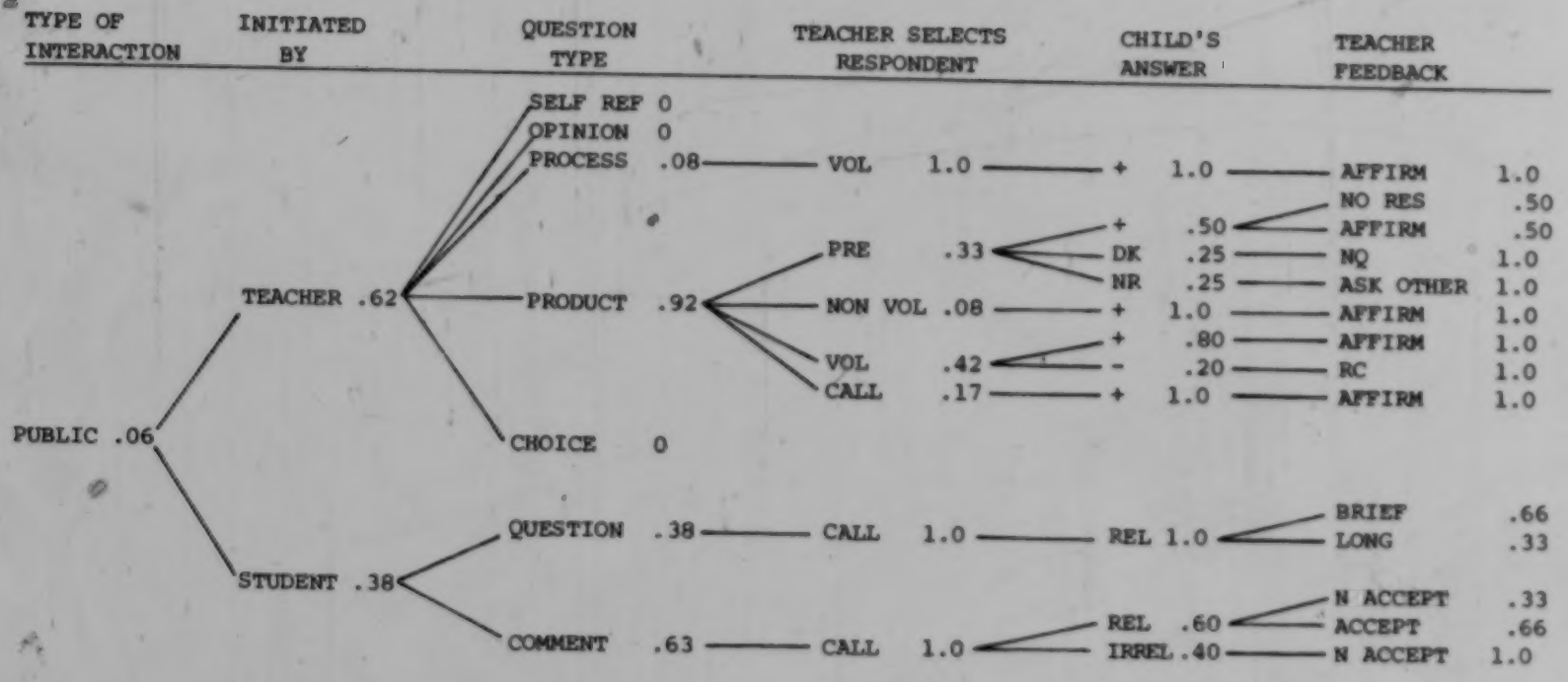


FIGURE 10

TEACHER NO. 1 IN MATHS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—332 of 353

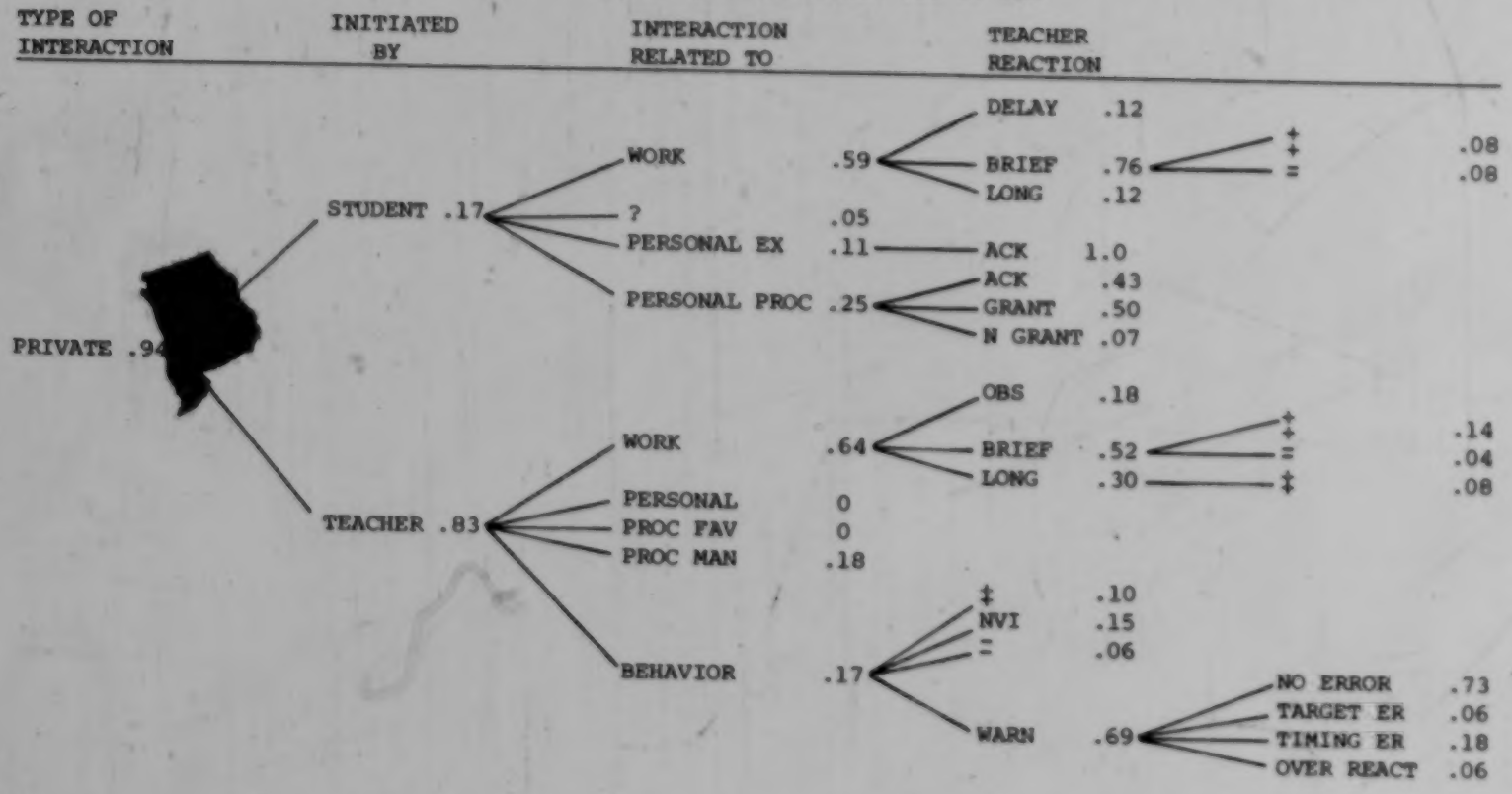
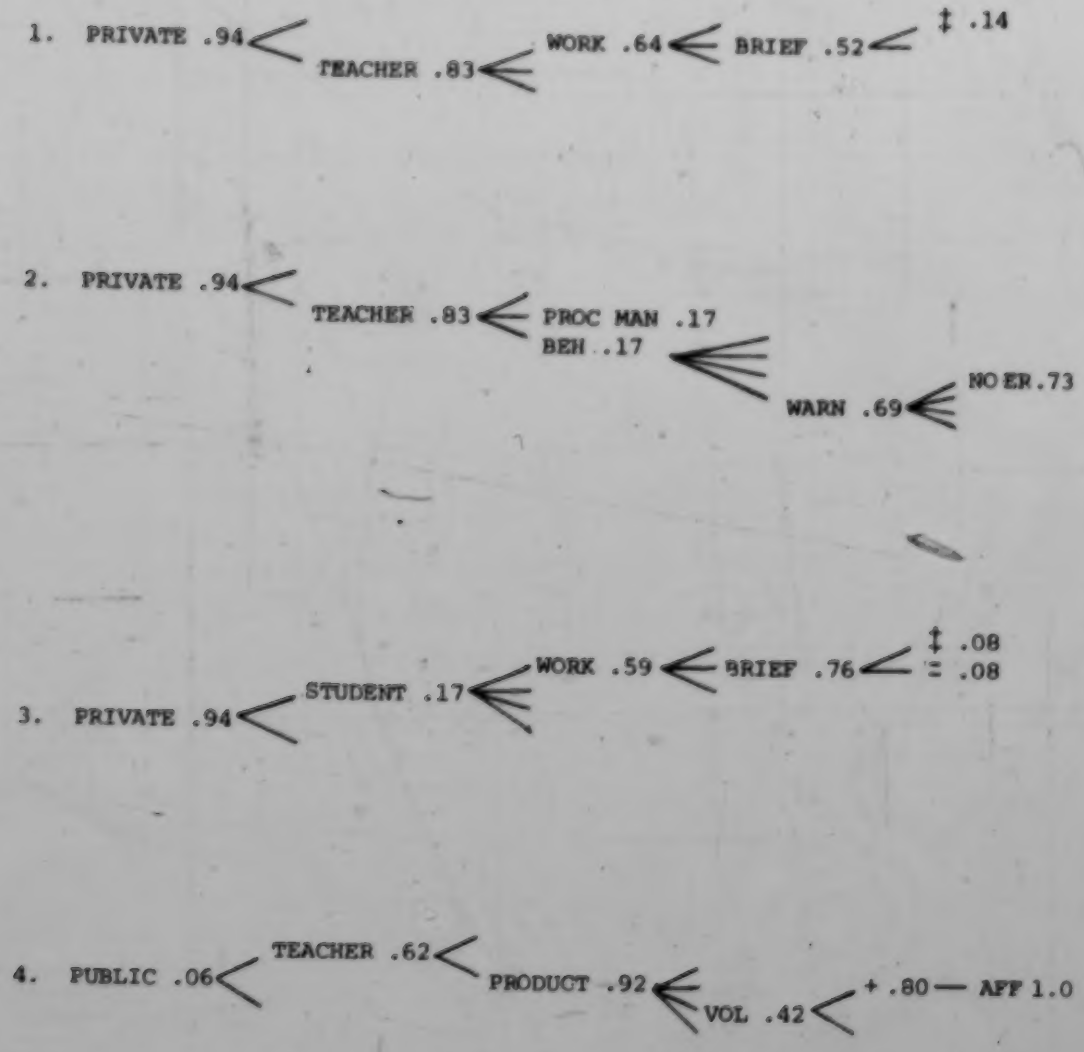


FIGURE 11

TEACHER NO. 1—PROPORTION OF MAIN INTERACTION SEQUENCES IN MATHEMATICS



the teacher asking product question (.96 in language arts and .92 in mathematics). The level of difficulty was low so that the probability of the questions being answered correctly was very high. Teacher 1 was one of two teachers in this study who preselected children before asking a question more often than choosing a non-volunteer, volunteer or call-out. Preselected children who failed to give the correct answer were always sustained. The majority of answers, whether correct or incorrect, however, were terminated.

The emphasis of this type of interaction is on the acquisition of factual information. An agenda or curriculum is in the mind of the teacher who ensures that it is "covered" by asking simple recall or product questions (96 percent of the time). By preselecting students and asking low level questions it is possible to increase the probability of correct answers, and to decrease the probability of ideas, answers or content not on the agenda, to be introduced into the lesson. The questioning sequence is an example of a recitation pattern which may be most appropriate for the acquisition of facts and information but certainly is not appropriate for facilitating student concept formation or student thinking beyond the simple recall level.

A comparison of language arts and mathematics sequences shows that they are virtually identical. Interaction patterns and questioning techniques do not appear to be a function of subject matter with this teacher and class.

Table 19

High achievers, as measured by the MAT total reading scores, interacted with the teacher more frequently than low achievers. There was one exception: the high achievers had fewer long private teacher initiated interactions than the lows.

Table 20

High and low reading achievers may be traced to see where they rank on a number of measures. Students 21, 26, 17, 22, and 19 are the high achievers and students 4, 7, 24, 8, and 23 the low achievers on the MAT total reading subscale. With the exception of student 26, the high achievers rank in the top half of the frequency of total interactions, and the top half of public teacher initiated and student initiated interactions. All the high achievers listed above, rank in the top nine on the SEI school-academic self-concept subscale. Their scores on the attitude test (SAT) are particularly spread (student 26 ranking highest on attitudes to school, instruction, teacher, and others, and student 19 ranking the lowest most negative attitudes).

Students 7, 26, 23, and 16 whose interactions are mainly academic or work related also score high on the SAT.

Tables 21 and 22

Table 21 provides correlations between B and E process variables and MAT total reading and total mathematics scores, SAT total scores, SEI (school-academic subtest) scores, the number of

TABLE 19

TEACHER 1 - B AND E PROCESS VARIABLES AND FREQUENCY OF INTERACTION FOR HIGH AND LOW ACHIEVERS ON THE MAT TOTAL READING SUBTEST

| | Process Variables | Frequence of Interaction Totals | Totals N = 27 | $\bar{x}$ for Hi Ach | $\bar{x}$ for Lo Ach |
|---|---|---|---|---|---|
| 1. | Private Interactions | 909.33 | 33.68 | 35.47 | 31.59 |
| 2. | Teacher Initiated | 651.24 | 24.12 | 24.86 | 23.54 |
| *3. | Work (Brief + Obs) | 195.80 | 7.25 | 9.07 | 6.62 |
| *4. | Work, Long | 175.31 | 6.49 | 4.50 | 8.39 |
| 5. | Procedure | 145.02 | 5.37 | 6.79 | 5.11 |
| *6. | Behavior, Warn | 106.23 | 3.93 | 3.30 | 2.37 |
| 7. | Student Initiated | 258.11 | 9.56 | 8.79 | 8.06 |
| *8. | Work, Brief | 99.74 | 3.69 | 2.60 | 3.17 |
| 9. | Work, Long | 73.85 | 2.74 | 4.70 | 2.66 |
| 10. | Public Interactions | 163.17 | 6.04 | 9.64 | 3.53 |
| 11. | Teacher Initiated | 98.37 | 3.64 | 4.90 | 2.04 |
| 12. | Self Ref Ques | 0.0 | -- | -- | -- |
| 13. | Process To (Pre + N Vol) + Ans | 0.0 | -- | -- | -- |
| 14. | Process To (Vol + Call) + Ans | 0.0 | -- | -- | -- |
| *15. | (Product + Choice) To (Pre + N Vol) + Ans | 46.13 | 1.71 | 2.45 | .80 |
| 16. | (Product + Choice) To (Vol. + Call) + Ans | 28.35 | 1.05 | 1.80 | .44 |
| | Teacher Feedback | | | | |
| *17. | + Ans, Affirmed | 55.03 | 2.01 | 3.05 | 1.24 |
| 18. | + Ans, No Response | 7.21 | .27 | .40 | 0.0 |
| 19. | Failure to Ans +, Term | 9.21 | .34 | .40 | .40 |
| 20. | Failure to Ans +, Sus | 9.69 | .36 | .25 | 0.0 |
| 21. | Student Initiated | 64.79 | 2.40 | 4.75 | 1.47 |
| 22. | Comment | 60.37 | 2.24 | 4.55 | 1.49 |
| 23. | Comm + Ques Accepted | 54.35 | 2.01 | 4.35 | 1.24 |

*Indicates the main interaction sequences.

TABLE 20

STUDENTS OF TEACHER 1, RANK ORDERED BY FREQUENCY AND PROPORTION OF INTERACTION, ACHIEVEMENT SCORES, ATTITUDE SCORES AND FREQUENCY OF DISCIPLINE PROBLEMS AND ABSENTEEISM

| | Frequency of Interactions | | | | | | | Interaction Proportions | | | | | Achievement | Attitudes | Self-concept | Behaviors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Private | | | Public | | | Total Public & Private | | | Private | | | | | | |
| Rank Order | Total Priv & Pub Interactions | Total | Teacher Initiated | Student Initiated | Total | Teacher Initiated | Student Initiated | Acad Total | Acad with Praise Total Work | Acad with Crit Total Work | Work Long Total Work | Work Brief Total Work | MAT Total Reading | SAT Total Score | SEI Sch-Ach Subscale | No. of Disc | Absenteeism |
| Totals | 1072.50 | 909.36 | 651.24 | 258.11 | 163.17 | 98.37 | 64.79 | | | | | | | | | 2 | 251.00 |
| High Score | 98.70 | 80.42 | 37.00 | 43.87 | 19.00 | 7 | 13.40 | .92 | .29 | .17 | .79 | .82 | 74 | 105 | 16 | 1 | 50.5 |
| 1 | 27 | 27 | 25 | 27 | 21 | 25 | 27 | 7 | 4 | 8 | 14 | 13 | 21 | 26 | 21 | 27 | 3 |
| 2 | 21 | 4 | 27 | 4 | 27 | 19 | 21 | 26 | 24 | 3 | 1 | 11 | 26 | 4 | 27 | 10 | 11 |
| 3 | 17 | 10 | 10 | 17 | 19 | 21 | 20 | 3 | 15 | 6 | 3 | 12 | 17 | 22 | 26 | * | 21 |
| 4 | 10 | 17 | 20 | 21 | 17 | 17 | 19 | 23 | 8 | 26 | 24 | 22 | 22 | 7 | 19 | | 26 |
| 5 | 20 | 20 | 4 | 10 | 20 | 9 | 10 | 16 | 12 | 10 | 17 | 10 | 19 | 18 | 20 | | 27 |
| 6 | 4 | 25 | 17 | 20 | 10 | 16 | 22 | 15 | 1 | 23 | 4 | 21 | 14 | 2 | 7 | | 5 |
| 7 | 25 | 21 | 24 | 19 | 25 | 24 | 17 | 18 | 7 | 22 | 6 | 7 | 27 | 23 | 22 | | 13 |
| 8 | 19 | 2 | 2 | 9 | 9 | 5 | 4 | 12 | 11 | 14 | 15 | 27 | 6 | 16 | 5 | | 15 |
| 9 | 9 | 6 | 6 | 2 | 16 | 12 | 18 | 1 | 3 | 27 | 8 | 9 | 16 | 11 | 17 | | 16 |
| 10 | 24 | 9 | 22 | 18 | 1 | 1 | 5 | 2 | 25 | 9 | 20 | 19 | 1 | 17 | 2 | | 8 |
| 11 | 2 | 19 | 13 | 12 | 5 | 27 | 24 | 20 | 13 | 4 | 18 | 23 | 5 | 5 | 10 | | 6 |
| 12 | 6 | 24 | 21 | 6 | 24 | 10 | 1 | 24 | 14 | 19 | 23 | 25 | 9 | 9 | 4 | | 12 |
| 13 | 22 | 14 | 14 | 16 | 22 | 18 | 7 | 21 | 9 | * | 2 | 18 | 2 | 13 | 6 | | 23 |
| 14 | 14 | 22 | 9 | 15 | 18 | 20 | 16 | 19 | 27 | | 25 | 16 | 11 | 1 | 9 | | 14 |
| 15 | 18 | 13 | 19 | 8 | 12 | 22 | 26 | 17 | 2 | | 19 | 5 | 10 | 12 | 18 | | 20 |
| 16 | 13 | 15 | 15 | 14 | 7 | 11 | 13 | 27 | 19 | | 26 | 26 | 3 | 25 | 11 | | 16 |
| 17 | 15 | 8 | 8 | 1 | 4 | 14 | 9 | 5 | 20 | | 5 | 2 | 13 | 3 | 12 | | 1 |
| 18 | 8 | 18 | 5 | 13 | 14 | 7 | 25 | 11 | 17 | | 16 | 8 | 25 | 21 | 8 | | 22 |
| 19 | 5 | 12 | 18 | 23 | 11 | 15 | 14 | 4 | 5 | | 7 | 20 | 15 | 6 | 25 | | 10 * |
| 20 | 16 | 3 | 3 | 25 | 8 | 2 | 8 | 6 | 21 | | 21 | 15 | 12 | 15 | 3 | | 2 |
| 21 | 12 | 5 | 7 | 24 * | 13 | 6 | 11* | 9 | 6 | | 9 | 6 | 18 | 20 | 15 | | 25 |
| 22 | 7 | 23 | 23 | 22 | 26 | 3 | 23 | 22 | 18 | | 10 | 1 | 20 | 24 | 1 | | 17 |
| 23 | 3 | 16 | 12 | 7 | 15 | 4 | 12 | 14 | 10 | | 22 | 3 | 4 | 8 | 23 | | 9 |
| 24 | 23 | 7 | 26 | 26 | 6 | 23 | 3 | 10 | 23* | | 27 | 24 | 7 | 10 | 24 | | 19 |
| 25 | 1 | 26 | 16 | 1 | 2 | 13 | 15 | 8 | 22 | | 12 | 4 | 24 | 27 | 13 | | 24 |
| 26 | 26 | 1 | 1 | 5 | 3 | 8 | 2 | 13 | 26 | | 11 | 17 | 8 | 14 | 16 | | 4 |
| 27 | 11 | 11 | 11 | 11 | 23 | 26 | 6 | 25 | 16 | | 13 | 14 | 23 | 19 | 14 | | 7* |
| Low Score | 13.54 | 11.08 | 8.62 | 2.46 | 1.00 | 1.00 | 0.0 | .49 | 0.0 | 0.0 | .18 | .21 | 27 | 75 | 4 | 0 | 0 |
| X Score | 39.72 | 33.68 | 24.12 | 9.56 | 6.04 | 3.64 | 2.4 | .69 | .10 | .03 | .42 | .53 | 50.67 | 91.33 | 12.15 | .074 | 9.30 |

*Indicates when score of zero (0) begins.

TABLE 21

TEACHER 1 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

| Process Variables | MAT Total Reading | MAT Total Math | SAT Total Score | SEI Sch-Ach Subscale | Discipline Visits to Office | Absenteeism |
|---|---|---|---|---|---|---|
| 1. Private Interactions | .190 | .126 | -.388** | .349* | .640*** | -.148 |
| 2. Teacher Initiated | .117 | .090 | -.388** | .225 | .434** | -.271 |
| †3. Work (Brief + Obs) | .197 | .250 | -.019 | .353* | .239 | -.149 |
| †4. Work, Long | -.226 | -.284 | -.159 | -.161 | .014 | -.143 |
| 5. Procedure | .210 | .202 | -.180 | .140 | -.004 | -.232 |
| †6. Behavior, Warn | .191 | .041 | -.422** | .171 | .611*** | -.103 |
| 7. Work/Total | -.287 | -.096 | .444** | -.189 | -.354* | .120 |
| 8. Proc/Total | .162 | .078 | .032 | .011 | -.208 | .018 |
| 9. Beh/Total | .123 | .046 | -.458** | .085 | .638*** | -.062 |
| 10. Student Initiated | .216 | .160 | -.299 | .389** | .691*** | .004 |
| †11. Work, Brief | .051 | .122 | -.263 | .344* | .789*** | .034 |
| 12. Work, Long | .274 | -.090 | -.244 | .253 | .164 | .083 |
| 13. Work/Total | -.202 | -.306 | .193 | .235 | -.032 | .303 |
| 14. Work Long/T & S Work | -.108 | -.328* | -.222 | -.282 | -.283 | .030 |
| 15. Work Brief/T & S Work | -.055 | -.310 | .184 | .197 | .198 | .001 |
| 16. Public Interactions | .543*** | .115 | -.343* | .384** | .442** | -.108 |
| 17. Teacher Initiated | .438** | .016 | -.275 | .546*** | .103 | -.249 |
| 18. Self Ref Ques | -- | -- | -- | -- | -- | -- |
| 19. Process To (Pre + N Vol) + Ans | -- | -- | -- | -- | -- | -- |
| 20. Process To (Vol + Call) + Ans | -- | -- | -- | -- | -- | -- |
| †21. (Product + Choice) To (Pre + N Vol) + Ans | .539*** | -.201 | -.343* | .128 | .189 | -.354* |
| 22. (Product + Choice) To (Vol + Call) + Ans | .236 | -.167 | -.051 | .083 | .152 | .162 |
| Teacher Feedback | | | | | | |
| †23. Correct (+) Ans, Affirmed | .514*** | .027 | -.175 | .197 | .140 | -.143 |
| 24. + Ans, No Response | .241 | -.040 | -.232 | .269 | .450** | -.033 |
| 25. Failure to Ans +, Terminated | -.178 | -.040 | -.120 | -.194 | -.199 | -.180 |
| 26. Failure to Ans +, Sustained | .204 | -.058 | .187 | -.146 | .198 | .087 |
| 27. Student Initiated | .468** | .170 | -.297 | .436** | .552*** | .016 |
| 28. Totals Private and Public | .300 | .141 | .377* | .047 | -.174 | .188 |
| 29. Acad with Praise / Total Work Contacts | -.417** | -.238 | -.109 | -.206 | -.168 | -.050 |
| 30. Acad with Criticism / Total Work Contacts | -.167 | -.146 | -.214 | .114 | .128 | .415** |

†Indicates main interaction sequences.

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 22

TEACHER 1 - CORRELATIONS BETWEEN B AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

| Process Variables | Teacher Directed Settings A | B | C | D | E | F | G | H | Non Teacher Directed Settings A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Private Interactions | .333* | .145 | .165 | .026 | .019 | -.104 | -.055 | -.087 | .106 | .217 | -.237 | -.245 | .129 | .234 | .015 | -.023 |
| 2. Teacher Initiated | .366* | .238 | -.001 | .017 | -.130 | -.050 | -.070 | .059 | .154 | .294 | -.252 | -.199 | .224 | .222 | -.110 | .126 |
| 3. Work (Brief + Obs) | .006 | -.099 | .148 | -.161 | .130 | -.186 | -.281 | -.059 | .324* | .297 | -.244 | -.045 | -.006 | .454** | -.075 | -.196 |
| 4. Work, Long | .218 | .476** | .025 | -.055 | -.373* | .263 | .214 | .236 | -.014 | .140 | -.053 | -.144 | .213 | -.083 | -.181 | .500*** |
| 5. Procedure | .355* | .291 | -.530*** | .273 | -.031 | -.029 | -.125 | -.069 | -.155 | -.059 | -.100 | .016 | .314 | -.192 | -.082 | .208 |
| 6. Behavior, Warn | -.232 | .021 | .218 | -.313 | -.103 | .258 | .091 | .152 | .150 | .229 | -.261 | -.256 | .103 | .277 | .062 | -.148 |
| 7. Work/Total | .132 | -.152 | .238 | .035 | .036 | -.126 | -.052 | -.024 | .079 | -.073 | .166 | .095 | -.144 | -.019 | -.078 | .174 |
| 8. Proc/Total | .061 | .078 | -.506*** | .326* | .144 | -.107 | -.141 | -.189 | -.318 | -.318 | -.061 | .104 | .143 | -.350* | .088 | .049 |
| 9. Beh/Total | .132 | -.152 | .238 | .035 | .036 | -.126 | -.052 | -.024 | .196 | .290 | -.157 | -.198 | .064 | .357* | .002 | .176 |
| 10. Student Initiated | .224 | .023 | .286 | .028 | .157 | -.132 | -.028 | -.207 | .035 | .094 | -.169 | -.212 | .008 | .192 | .131 | -.160 |
| 11. Work, Brief | .150 | -.085 | .329* | .017 | .094 | -.110 | -.017 | -.111 | .028 | .081 | -.156 | -.236 | -.149 | .223 | .163 | -.135 |
| 12. Work, Long | .441** | .299 | -.052 | .216 | .019 | -.072 | -.292 | -.134 | .039 | .136 | -.013 | .074 | .225 | -.191 | -.109 | .013 |
| 13. Work/Total | .186 | .148 | -.138 | .170 | -.132 | -.039 | -.128 | .080 | .015 | .051 | .291 | .227 | -.091 | -.398** | -.118 | .110 |
| 14. Work, Long/T & S Work | .096 | .439** | -.141 | .070 | -.286 | .228 | .119 | .163 | -.128 | .006 | .080 | .009 | .216 | -.333* | -.169 | .492*** |
| 15. Work, Brief/T & S Work | -.147 | -.437** | .089 | -.030 | .245 | -.206 | -.223 | -.109 | .136 | -.020 | -.089 | .082 | -.279 | .318 | .137 | -.449** |
| 16. Public Interactions | .020 | -.317 | -.093 | -.096 | .343* | -.242 | -.094 | -.252 | -.236 | -.126 | -.366* | -.180 | .044 | .179 | .261 | -.392 |
| 17. Teacher Initiated | -.158 | -.301 | .168 | -.168 | .145 | .017 | .093 | -.055 | -.386** | -.316 | -.192 | .032 | .146 | .000 | .212 | -.316 |
| 18. Self Ref Ques | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 19. Process To (Pre + M Vol) + Ans | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 20. Process To (Vol + Call) + Ans | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 21. (Product + Choice) To (Pre + M Vol) + Ans | -.080 | -.142 | .129 | -.117 | -.104 | .081 | .033 | .161 | -.229 | -.254 | -.159 | .068 | .050 | .117 | .149 | -.244 |
| 22. (Product + Choice) To (Vol + Call) + Ans | -.003 | -.319 | .115 | -.096 | .393** | -.123 | -.060 | -.313 | -.339* | -.252 | -.194 | -.050 | .075 | -.213 | .277 | -.281 |
| Teacher Feedback | | | | | | | | | | | | | | | | |
| 23. Correct (+) Ans, Affirmed | .000 | -.324* | -.070 | -.127 | .201 | -.132 | .028 | -.096 | -.479** | -.366* | -.321 | -.122 | .123 | -.074 | .326* | -.241 |
| 24. + Ans, No Response | -.065 | -.261 | .250 | -.048 | .150 | .212 | -.180 | -.087 | -.091 | -.218 | -.061 | .289 | -.007 | .001 | .048 | -.346* |
| 25. Failure to Ans +, Terminated | -.008 | -.015 | .089 | .003 | -.108 | -.023 | -.073 | .120 | .179 | .191 | .252 | .369* | .444** | -.144 | -.369* | -.024 |
| 26. Failure to Ans +, Sustained | -.262 | .027 | -.132 | -.166 | .172 | .172 | .352* | -.171 | -.321 | -.442** | -.100 | -.241 | -.251 | -.044 | .415** | -.119 |
| 27. Student Initiated | .135 | -.244 | .017 | -.021 | .384** | -.351* | -.195 | -.318 | -.073 | .036 | -.385** | -.279 | -.036 | .252 | .225 | -.212 |
| Totals Private and Public | | | | | | | | | | | | | | | | |
| 28. Acad with Praise / Total Work Contacts | .146 | .126 | .019 | .126 | -.272 | .029 | -.154 | .234 | -.139 | -.072 | -.249 | .188 | .326 | -.074 | -.217 | .375* |
| 29. Acad with Criticism / Total Work Contacts | .055 | .089 | -.150 | .362* | -.065 | -.227 | .016 | -.016 | .018 | .323* | .234 | .052 | -.003 | .158 | -.346* | .433** |

* .10 > p > .05
** .05 > p > .01
*** p < .01

discipline visits to the office, and absenteeism.* All the correlations, with the exception of correlations for MAT total mathematics, were calculated on B and E process data collected in language arts classes. The mathematics scores were correlated to process data collected in mathematics classes. Table 21, therefore, contains 135 correlations (for language arts) of which 32 are significant correlations.

The highlighting of correlational analysis will be limited to those variables which relate to the teacher's main interaction sequences. Correlations of other variables are reported in the tables but are based on a small proportion of the total number of dyadic interactions.

Table 22 contains correlations between the B and E process variables and the behavioral styles coefficients calculated from the pupil observational data (see Appendix B for CASES behavioral categories, the brief form for quick reference, and the CASE styles work sheet for a description of how the styles were calculated). Appendix E, Table E-1 contains all the styles calculated for each student in class 1.

Data in Tables 21 and 22 will be discussed under three headings: (1) private interactions, (2) public interactions, and

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*Note: Teacher report card grades, teacher rankings and MAT subtests were not included in the tables as they were found to correlate highly with MAT total reading and total mathematics scores. SAT and CAI total scores were used as indicators of attitudes toward school for grades 1 and grades 3 and 6 respectively.

(3) praise and criticism.

1. Private Interactions (Tables 21 and 22)

None of the process variables related to the main private interaction sequences are significantly related to achievement. If 85 percent of all interactions are in the private domain, one would expect that some of this work with the children would be positively related to achievement.

Private interactions, however, do relate significantly to pupil attitudes and school academic self-concept. More specifically, four variables that are not independent—namely the total number of private interactions, teacher initiated private interactions, behavior warnings, and the percentage of interactions that are behavior warnings—all yield significant negative correlations with attitudes to school, instruction, and teacher (SAT). An important exception is that the percentage of work related interactions is positively related to SAT attitude scores. The frequency of both teacher and student initiated work contacts, although brief are positively related to student school-academic self-concept.

A comparison of data in Tables 20 and 21 reveals that two students (27 and 10) account for all the significant positive correlations between private interaction variables and number of discipline visits to the office. They also score low on the SAT and are in the lower half of percentage interactions that are academic in nature. The students in question were described as two of the three most popular boys in the class. The same two students account for 15 percent of all dyadic interactions in the class. (Student 10 has

57 total public plus private interactions.)

Table 22. The visible style for all the children in non-teacher directed settings was style G* (inner-directed, task oriented). In teacher directed settings the visibility styles were style E (adult dependent) and/or style H (other directed, task oriented). (See Appendix E, Table E-1.) In other words, the children worked very well both in teacher directed and non-teacher directed settings. Only one student exhibits a style A (aggressive, manipulative) in teacher directed settings. Some students did however seem to exhibit more style A behaviors and slightly more style B behaviors (peer oriented, non-conforming) in teacher directed settings than they did in non-teacher directed settings. The positive correlations in Table 22, between private interaction process variables and style A and B behaviors seem to mean that these children, when in teacher directed settings, demanded and received the teacher's attention. They received more private interactions, more teacher initiated private interaction, more procedural comments and, when these same students initiated interactions, they received long attention. Students who exhibited style B behaviors received long attention from the teacher. It may be that this close supervision by the teacher was a factor in these students working productively in non-teacher directed settings. The students who exhibited style C behaviors (passive, withdrawn) in teacher directed settings received few

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*Styles will be identified by letter and one or two words taken from the Cases styles worksheet. In the text styles A and B will sometimes be referred to as attention-getting behavioral styles.

procedural interactions, had proportionately little procedural help and when they did initiate interaction with the teacher received brief attention.

The correlations between private interactions and style F behaviors (social, productive) in non-teacher directed settings seem to indicate that students are kept productive with frequent, though brief, work related contacts and a high proportion of behavior warnings. It is impossible for them also to have a high proportion of work related contacts, hence the negative correlations with proportion of work interactions and style F behaviors.

Long work related interactions initiated by the teacher are positively related with style H behaviors (other directed, task oriented). Perhaps these interactions result in such behaviors. Perhaps the long interactions initiated by the teacher are fostering a conformity and dependence. Brief contacts, or mere observations substituted for the long teacher initiated contacts may encourage greater inner-directed task-oriented behaviors.

2. Public Interactions

An examination of Table 21 reveals that four process variables related to the main public interaction sequences (number 3 in Figure 8) are positively related to reading achievement, but not to mathematics achievement. The four process variables are: 16—frequency of public interactions, 17—teacher initiated public interactions, 21—correctly answered product or choice questions asked of students who are pre-selected or who are non-volunteers, and 23—correct answers affirmed. Variable numbers 16 and 21 are also negatively related to pupil

attitudes. Variables 16 and 17 are positively related to positive self concept.

Table 22 shows that students who exhibit style G (inner-directed, task oriented) behaviors in non-teacher directed settings, answer questions correctly and have their answers affirmed by the teachers. They also have their answers sustained when they fail to answer questions correctly. The teacher apparently pays little attention in terms of asking questions and affirming correct answers to students who exhibit style A and B behaviors in non-teacher directed settings.

Public interactions (total) and the product question to volunteers and calls sequence relate positively to style E behaviors (adult dependent) in teacher directed settings. This finding is consistent with the suggestion in the discussion above that the sequence (product questions to volunteer or call, answered correctly) was used for the purposes of control.

3. Praise and Criticism

The praise and criticism variables represent the number of times a student received praise or criticism within an academic interaction, divided by the total number of dyadic interactions.

Praise correlates negatively with reading achievement and positively with style H (other directed, task oriented) in non-teacher directed settings. It appears that students whom the teacher knew to be low achievers received proportionately more praise than the high achievers. There was an attempt, therefore, to encourage low achieving students by frequent praise.

Criticism correlates positively with absenteeism. It is possible that students who received frequent criticism within their total number of interactions disliked coming to school. It is also possible that students who were absent frequently received frequent criticism because of their poor attendance. Student number 3, for example, was selected by the teacher as one whom the teacher would be relieved to see removed from the class "because she misses so much school." (Note: This was in response to a hypothetical question asked the teacher during an interview. It was not a spontaneous remark but rather a forced choice.)

Both praise and criticism appear to result in students exhibiting style H (other-directed, task oriented) behaviors in non-teacher directed settings.

Brophy and Evertson (1973) have interpreted similar negative correlations between praise and achievement by saying ". . . frequent teacher praise seems to be unimportant as a motivating incentive, overly frequent praise appears to actually interfere with learning process" (p. 15). Praise appeared to be used by teacher 1 to encourage the low achievers. Praise from the teacher in this class was given with the knowledge of the achievement level of the student. It is reasonable therefore to suggest that praise was given as encouragement.

## Teacher 2 and Class 2 - Grade 1

The results for teacher and class 2 are reported in Figures 12 to 17 and Tables 23 to 26.

Figures 12 to 17

a. Private Interactions (.64 in language arts and .75 in mathematics)

The main interaction sequences for teacher 2 are in the private domain. The children initiate interactions more often than the teacher in language arts. The converse is true for mathematics. There are many activity centers in this classroom and much self-directed pupil work. The children were expected to be work-oriented, and generally they did fulfill these expectations. The teacher had high ratings on all of the eight high inference rating scales for the measurement of management, instructional, and interpersonal skills. Children were therefore able to approach the teacher easily with the assurance that they would be accepted and attended to with understanding and efficiency.

b. Public Interactions (.36 in language arts and .25 in mathematics)

Public interactions were characterized by the following sequence: product or choice question, to a volunteer or call out with a correct answer affirmed. Acknowledging call out answers as a preferred mode was unique to this teacher. It was consistent with the fact that there were many chorus answers acknowledged in this class (not coded in the B and E system) as well as a relatively high

FIGURE 12

TEACHER NO. 2 IN LANGUAGE ARTS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—407 of 1116

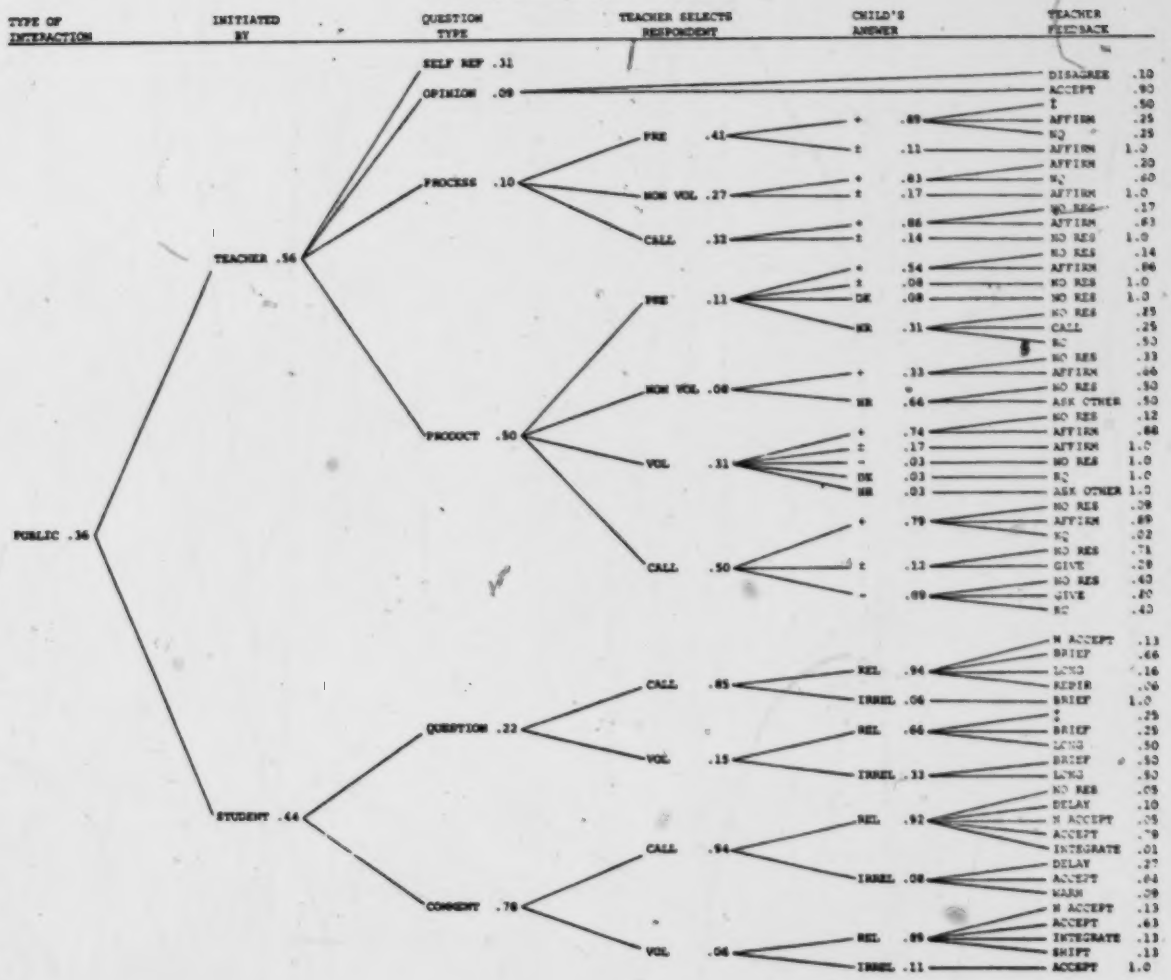


FIGURE 13

TEACHER NO. 2 IN LANGUAGE ARTS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—709 OF 1116

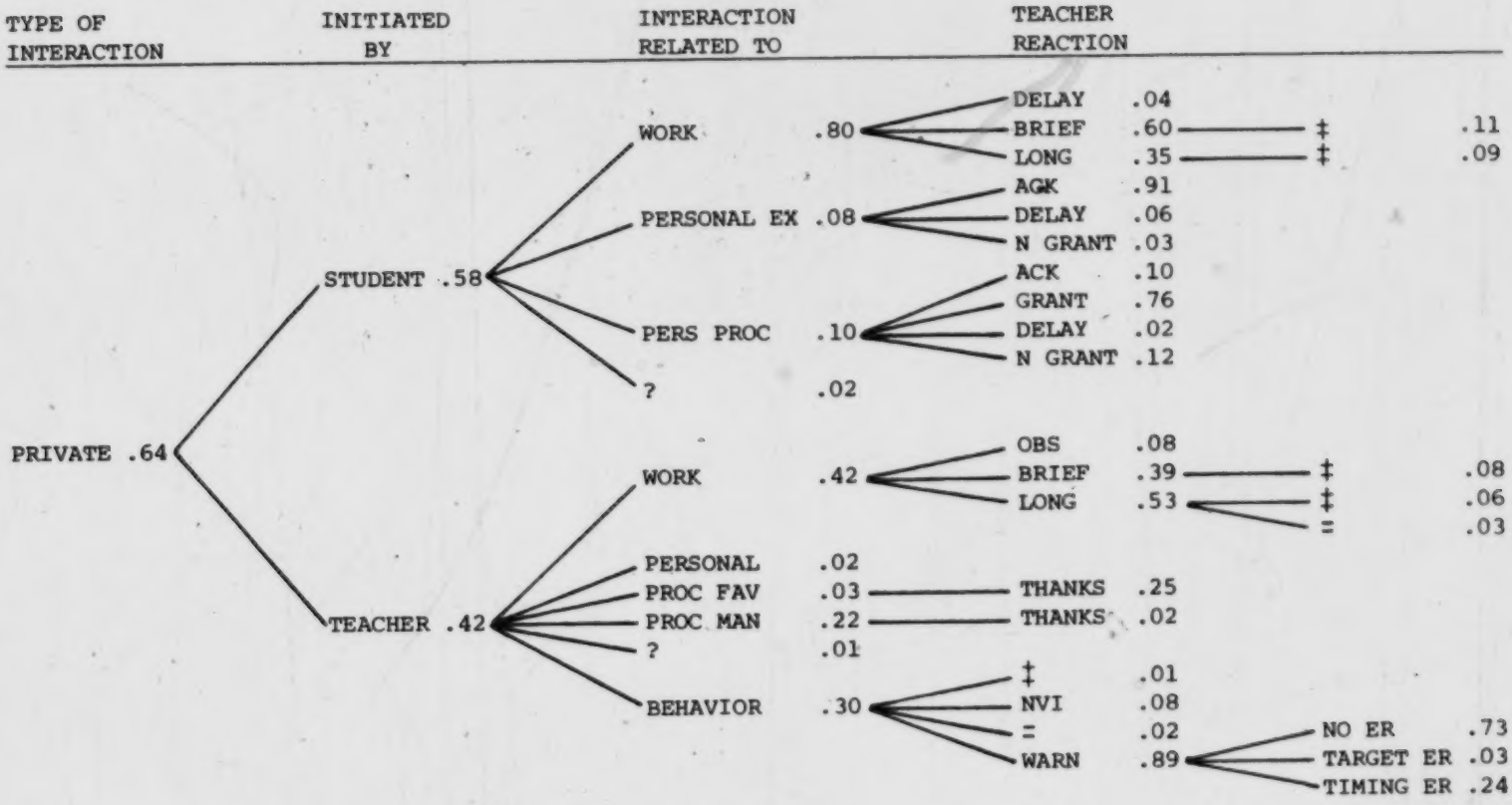


FIGURE 14

TEACHER NO. 2—PROPORTION OF MAIN INTERACTION SEQUENCES IN LANGUAGE ARTS

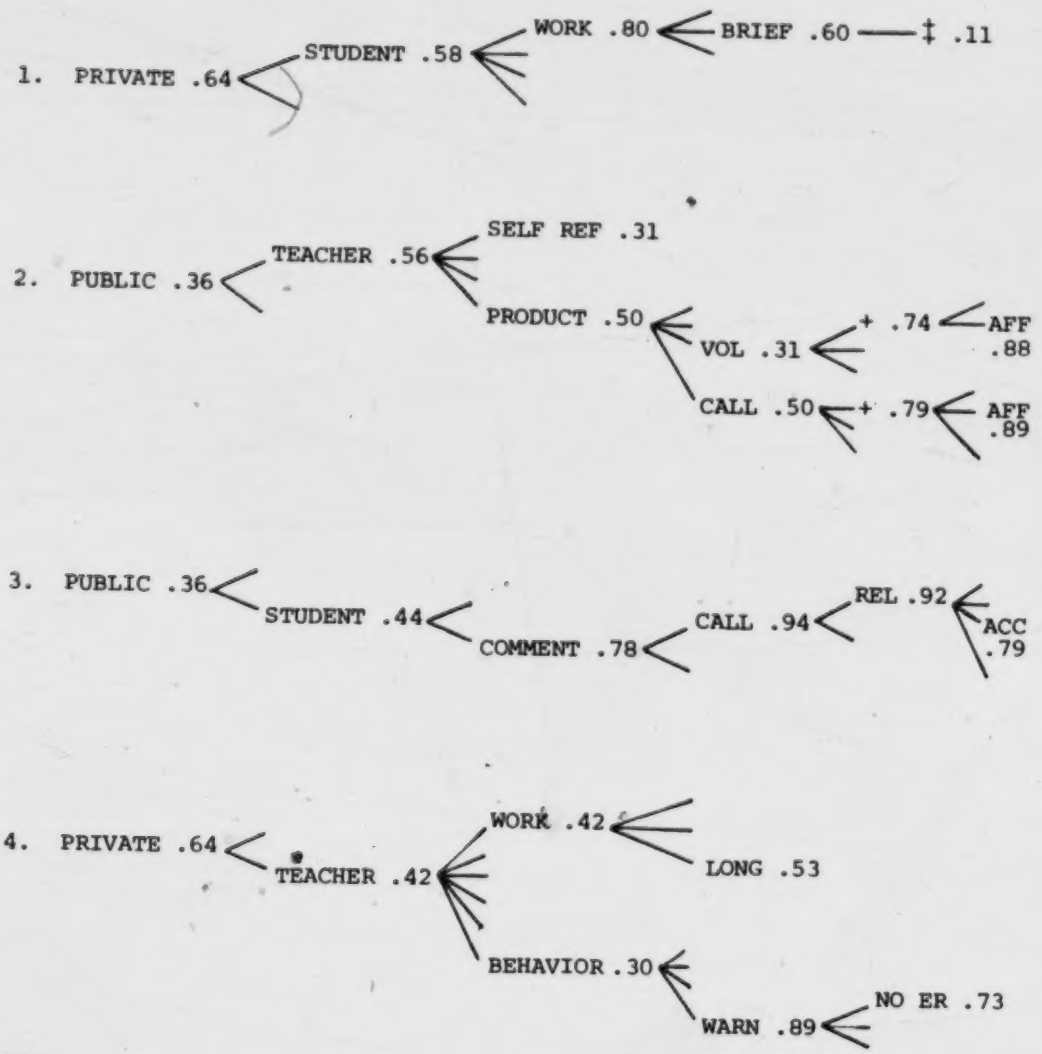


FIGURE 15

TEACHER NO. 2 IN MATHS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—63 OF 249

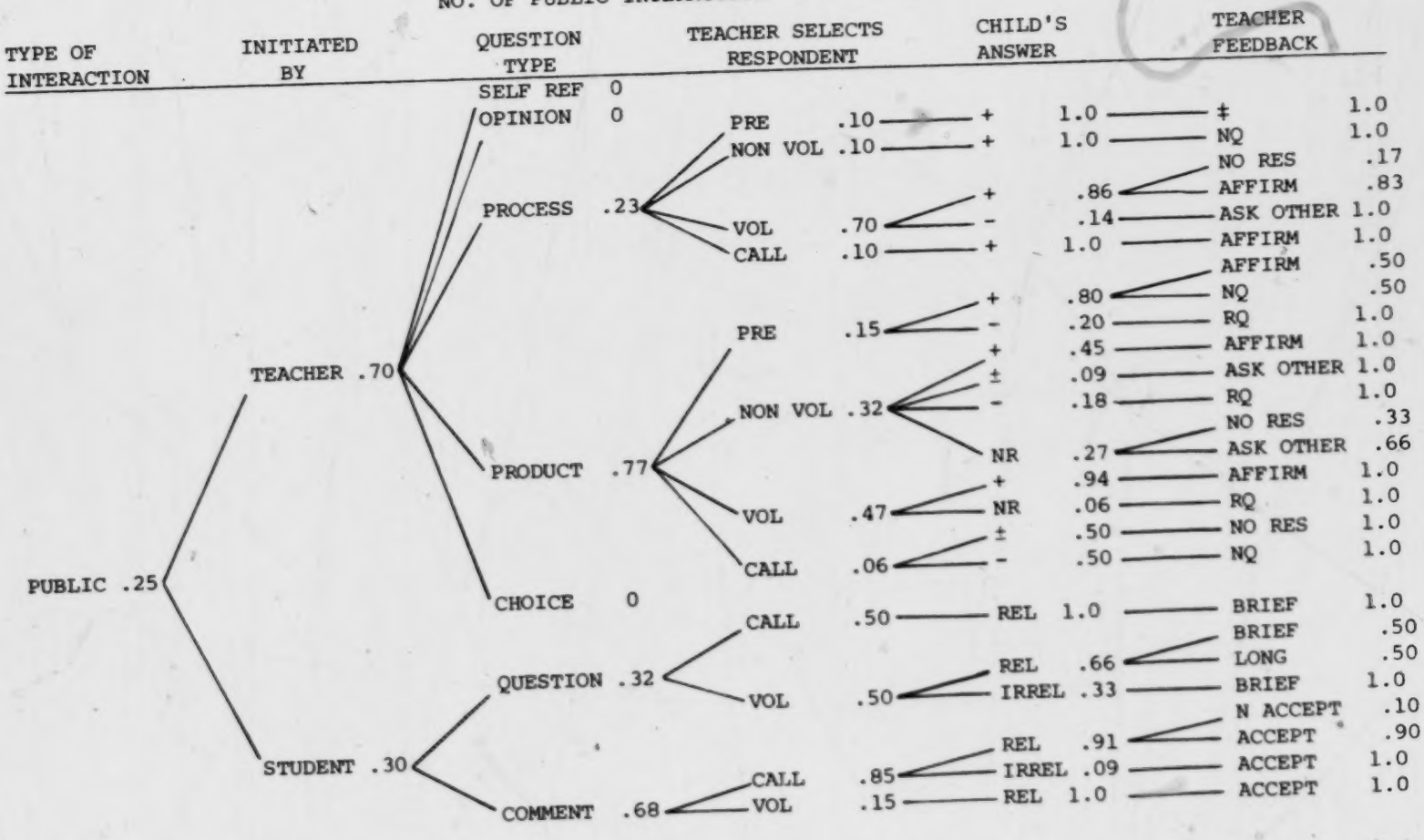


FIGURE 16

TEACHER NO. 2 IN MATHS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—186 OF 249

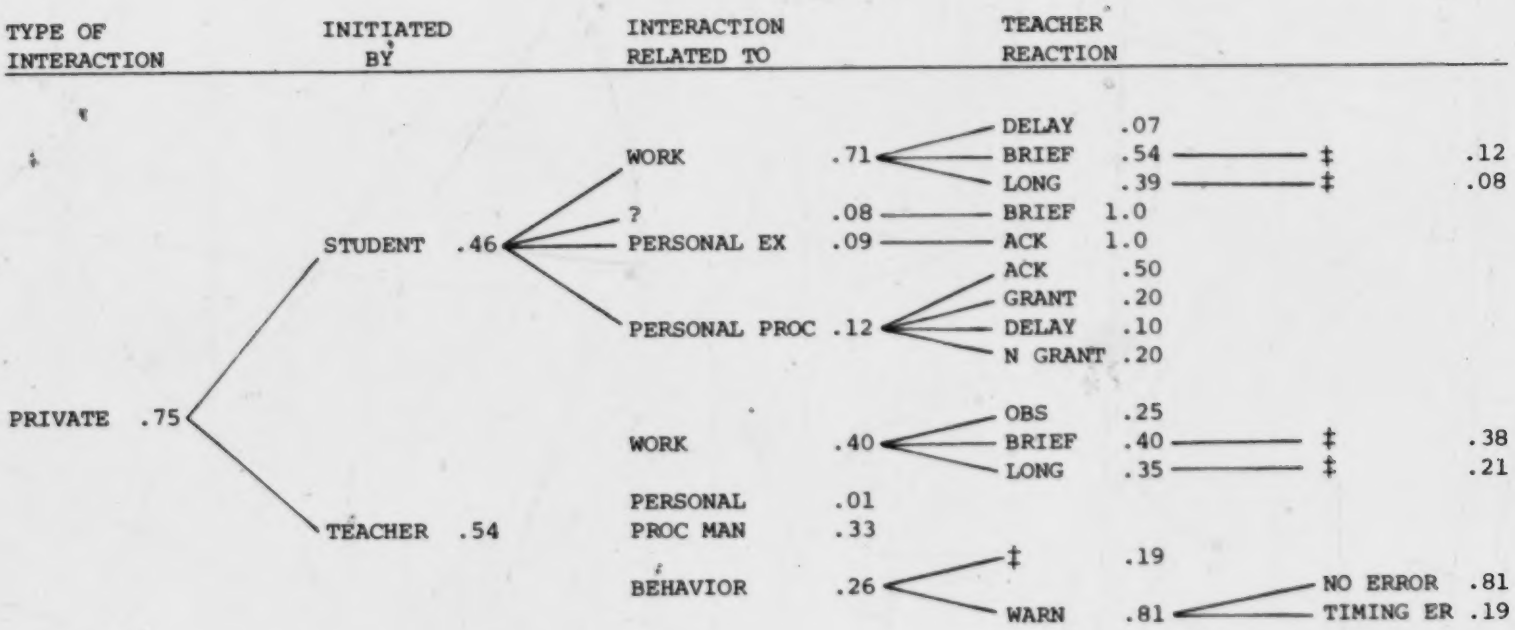
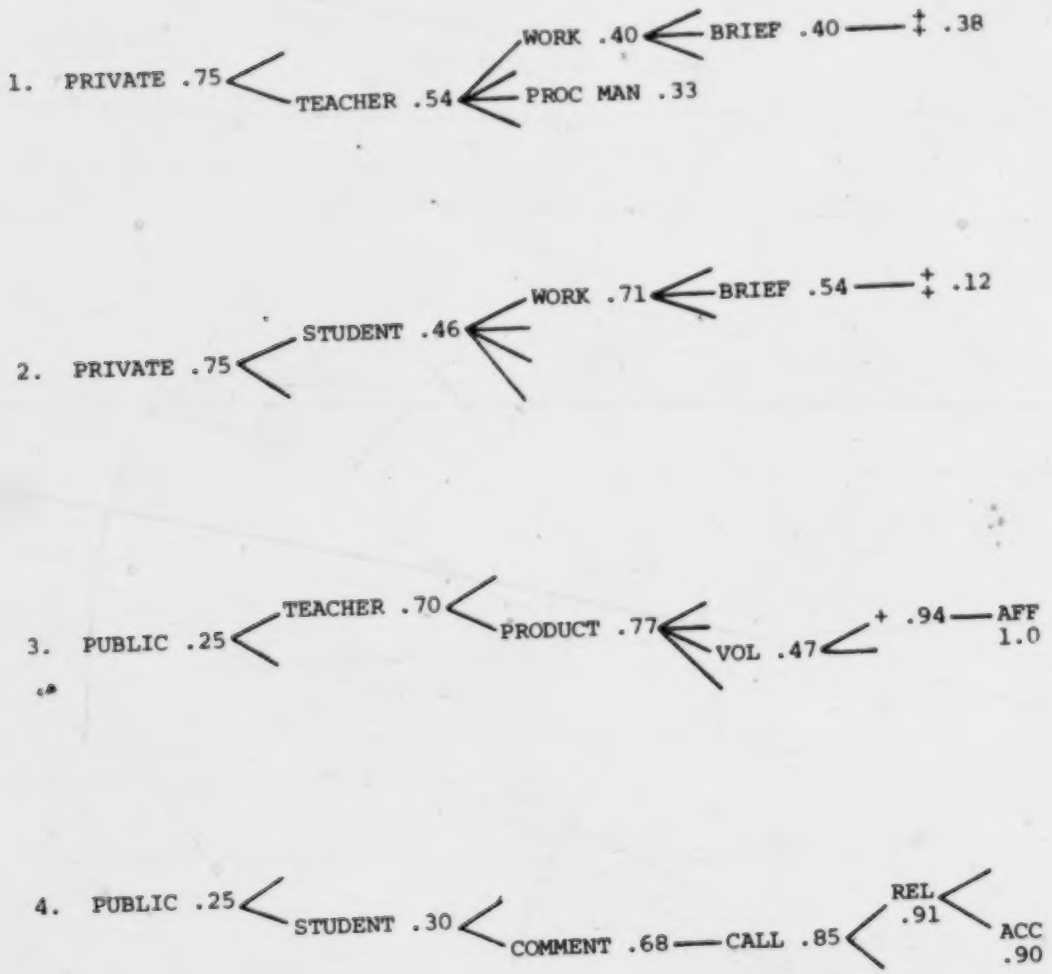


FIGURE 17

TEACHER NO. 2—PROPORTION OF MAIN INTERACTION SEQUENCES IN MATHEMATICS



proportion of student initiated public interactions. Such interactions were relevant comments that were called out and accepted by the teacher. There was freedom to speak out in this class although the comments were rarely probed, integrated or extended. Call out answers were usually terminated with an affirmation; call out comments were usually accepted; and call out questions were usually given brief answers by the teacher.

Another unique feature of this teacher's interactions was the frequent use of self reference questions in language arts. The teacher attempted to relate the materials under study to the experiences of the children or to move from the known to the unknown. The teacher reported:

> I really like the language experience program—where they talk about their own experiences. I feel that before they can think of what somebody else did, they know about what they have done and then they can go on to the next step—other people's experiences.

Again, the main sequences in language arts and mathematics, with minor variations, are identical.

Table 23

Table 23 indicates that low achievers had more private dyadic interactions with the teacher than high achievers. This is because the lows initiated more interaction with the teacher. The teacher however initiated more private interactions with the high achievers than with the lows.

In public interactions, the frequency of interaction favored the high achievers.

TABLE 23

TEACHER 2 - B AND E PROCESS VARIABLES AND FREQUENCY OF INTERACTION FOR HIGH AND LOW ACHIEVERS ON THE MAT TOTAL READING SUBTEST

| Process Variables | Frequence of Interaction | | | |
|---|---|---|---|---|
| | Totals | Totals N = 21 | $\bar{x}$ for Hi Ach | $\bar{x}$ for Lo Ach |
| 1. Private Interactions | 755.60 | 35.98 | 29.18 | 32.73 |
| 2. Teacher Initiated | 309.38 | 14.73 | 16.76 | 9.06 |
| 3. Work (Brief + Obs) | 60.69 | 2.89 | 2.57 | 2.10 |
| *4. Work, Long | 69.93 | 3.33 | 2.29 | 1.67 |
| 5. Procedure | 79.12 | 3.77 | 2.47 | 2.76 |
| *6. Behavior, Warn | 83.45 | 3.97 | 4.71 | 2.53 |
| 7. Student Initiated | 446.22 | 21.25 | 15.85 | 23.67 |
| *8. Work, Brief | 216.51 | 10.31 | 5.71 | 12.70 |
| 9. Work, Long | 127.05 | 6.05 | 5.05 | 5.96 |
| 10. Public Interactions | 425.21 | 20.25 | 22.99 | 8.73 |
| 11. Teacher Initiated | 236.99 | 11.29 | 12.18 | 3.67 |
| *12. Self Ref Ques | 73.86 | 3.52 | 4.38 | 1.33 |
| 13 Process To (Pre + N Vol) + Ans | 12.44 | .59 | .29 | .33 |
| 14. Process To (Vol + Call) + Ans | 6.00 | .29 | .86 | 0.0 |
| 15. (Product + Choice) To (Pre + N Vol) + Ans | 10.42 | .50 | 0.0 | 0.0 |
| *16. (Product + Choice) To (Vol + Call) + Ans | 73.11 | 3.40 | 4.85 | 1.00 |
| Teacher Feedback | | | | |
| *17. + Ans, Affirmed | 83.95 | 3.10 | 5.57 | .66 |
| 18. + Ans, No Response | 10.00 | .48 | .43 | .33 |
| 19. Failure to Ans +, Term | 22.68 | 1.08 | 1.05 | 0.0 |
| 20. Failure to Ans +, Sus | 6.3 | .30 | 0.0 | 0.0 |
| 21. Student Initiated | 188.22 | 8.96 | 10.81 | 5.06 |
| *22. Comment | 145.54 | 6.93 | 8.19 | 2.53 |
| *23. Comm + Ques Accepted | 153.51 | 7.31 | 9.09 | 4.63 |

*Indicates the main interaction sequences.

Table 24

Students 17 and 18 have similar ranks on a number of variables. Their ranks indicate that they had the lowest scores in reading, were frequently absent from school, had no questions asked of them in public interactions, and had the fewest number of private teacher initiated interactions. Furthermore, student 18 initiated no public interactions and very few private interactions. When students 17 and 18 did interact with the teacher, it usually involved praise. It is notable that they scored highest on the SAT (attitudes).

When the teacher was asked "which students would you like to give all your attention to if you could?" the answer given included students 17 and 18. Both were girls that the teacher described as "quite slow and needing extra help." The extra help was provided by the remedial teacher and the two girls spent time in the kindergarten as "helpers." The other low reading achiever, student 21, a boy, had frequent interactions with the teacher and had the highest score on school-academic self-concept. He was described by the teacher as "popular and an outgoing type of person."

Student 19, who received a very high proportion of the total private interactions (12 percent compared to a class mean of 4.7 percent), was described by the teacher as a boy who ". . . needs repetition. You must have noticed that whenever we read I mostly have him beside me because he is the one that has problems with the words."

TABLE 24

STUDENTS OF TEACHER 2, RANK ORDERED BY FREQUENCY AND PROPORTION OF INTERACTION, ACHIEVEMENT SCORES, ATTITUDE SCORES AND FREQUENCY OF DISCIPLINE PROBLEMS AND ABSENTEEISM

| | Frequency of Interactions | | | | | | | Interaction Proportions | | | | | Achievement | Attitudes | Self-concept | Behaviors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Private | | | Public | | | Total Public & Private | | | Private | | | | | | |
| Rank Order | Total Priv & Pub Interactions | Total | Teacher Initiated | Student Initiated | Total | Teacher Initiated | Student Initiated | Acad / Total | Acad with Praise / Total Work | Acad with Crit / Total Work | Work Long / Total Work | Work Brief / Total Work | MAT Total Reading | SAT Total Score | SEI Sch-Ach Subscale | No of Disc | Absenteeism |
| Totals | 1180.00 | 755.60 | 309.28 | 446.22 | 425.21 | 236.99 | 188.22 | | | | | | | | | | |
| High Score | 137.52 | 90.48 | 29.13 | 72.38 | 54.00 | 20.00 | 34.00 | .79 | .14 | .06 | 1.00 | .83 | 74 | 116 | 16 | 3 | 41.5 |
| 1 | 19 | 19 | 12 | 19 | 1 | 1 | 1 | 19 | 17 | 20 | 6 | 17 | 10 | 17 | 21 | 21 | 13 |
| 2 | 1 | 12 | 9 | 12 | 19 | 7 | 19 | 11 | 1 | * | 7 | 11 | 1 | 18 | 13 | 8 | 17 |
| 3 | 12 | 1 | 1 | 21 | 8 | 9 | 22 | 22 | 18 | | 20 | 16 | 6 | 19 | 5 | 9 | 9 |
| 4 | 22 | 21 | 20 | 17 | 22 | 8 | 8 | 18 | 7 | | 9 | 5 | 20 | 20 | 11 | * | 3 |
| 5 | 21 | 2 | 3 | 5 | 7 | 19 | 7 | 9 | 10 | | 12 | 18 | 14 | 9 | 17 | | 19 |
| 6 | 7 | 13 | 8 | 1 | 21 | 13 | 21 | 5 | 3 | | 22 | 14 | 16 | 21 | 16 | | 18 |
| 7 | 8 | 20 | 19 | 2 | 13 | 22 | 5 | 14 | 9 | | 1 | 19 | 22 | 2 | 10 | | 12 |
| 8 | 13 | 5 | 21 | 13 | 10 | 10 | 10 | 10 | 11 | | 21 | *15 | 12 | 11 | 20 | | 7 |
| 9 | 2 | 7 | 2 | 7 | 9 | 3 | 12 | 8 | 20 | | 8 | 2 | 2 | 13 | 2 | | 11 |
| 10 | 9 | 22 | 13 | 22 | 3 | 21 | 17 | 13 | 21 | | 13 | 10 | 15 | 5 | 15 | | 1 |
| 11 | 20 | 17 | 22 | 11 | 16 | 2 | 16 | 21 | 13 | | 3 | 13 | 11 | 10 | 19 | | 0 |
| 12 | 5 | 9 | 7 | 10 | 12 | 20 | 15 | 3 | 15 | | 10 | 3 | 7 | 12 | 22 | | 1 |
| 13 | 3 | 3 | 15 | 20 | 2 | 11 | 13 | 12 | 2 | | 19 | 8 | 8 | 6 | 12 | | 2 |
| 14 | 17 | 8 | 14 | 14 | 11 | 16 | 3 | 15 | 12 | | 2 | 21 | 13 | 7 | 18 | | 14 |
| 15 | 10 | 11 | 16 | 15 | 20 | 6 | 6 | 17 | 8 | | 15 | 22 | 19 | 16 | 14 | | 6 |
| 16 | 11 | 15 | 10 | 9 | 6 | 12 | 2 | 7 | 22 | | 14 | 1 | 9 | 14 | 8 | | 5 |
| 17 | 15 | 14 | 11 | 18 | 15 | 15 | 11 | 20 | 19 | | 18 | 20 | 5 | 3 | 6 | | 21 |
| 18 | 16 | 10 | 5 | 16 | 5 | 14 | 14 | 1 | 14* | | 5 | 12 | 3 | 22 | 3 | | 20 |
| 19 | 14 | 18 | 6 | 6 | 14 | 5 | 20 | 2 | 6 | | 16 | 9 | 21 | 15 | 9 | | 22 |
| 20 | 6 | 6 | 17 | 3 | 17 | 18* | 18* | 16 | 5 | | 17 | 7 | 18 | 1 | 1 | | 16 |
| 21 | 18 | 18 | 18 | 8 | 18* | 17 | 9 | 6 | 16 | | 11 | 6* | 17 | 8 | 7 | | 15 |
| Low Score | 12.00 | 12.00 | 4.00 | 5.00 | 0.0 | 0.0 | 0.0 | .37 | 0.0 | 0.0 | .09 | 0.0 | 20 | 70 | 6 | 0 | 13 |
| F Score | 56.23 | 35.98 | 14.73 | 21.25 | 20.25 | 11.29 | 8.96 | .67 | .06 | .003 | .41 | .56 | 49.81 | 99.43 | 12.67 | .24 | 9.26 |

*Indicates when score of zero (0) begins.

Tables 25 and 26

1. Private Interactions

Teacher initiated private interactions do not correlate significantly with reading or mathematics achievement scores. As might be expected, frequency of teacher initiated behavior warnings correlate negatively with pupil attitudes (SAT scores).

A number of correlations were found between student initiated private interactions and achievement, attitudes, and self-concept. It appears that students who did well in reading had negative self-concepts and received long private interactions with the teacher. Students who did not do well in reading had positive self-concepts and positive attitudes (SAT), and received brief private interactions with the teacher.

The dominant behavioral styles in teacher directed settings were styles E (adult dependent) and H (other directed, task oriented), although Style C (withdrawn) was visible in eight students. Few procedural and work contacts by the teacher but frequent behavior warnings with style C (withdrawn) students appeared to be the pattern, whereas the style B (peer oriented, non-conforming) students received high proportions of work contacts.

Frequent teacher initiated procedural contacts and long attention to student initiated interactions correlate positively with style G (inner-directed, task oriented) behaviors in teacher directed settings. In non-teacher directed settings teacher initiated behavior warnings correlate with style A (aggressive manipulative) behaviors and proportion of teacher initiated work interaction correlates

TABLE 25

TEACHER 2 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

| | Process Variables | MAT Total Reading | MAT Total Math | SAT Total Score | SEI Sch-Ach Subscale | Discipline Visits to Office | Absenteeism |
|---|---|---|---|---|---|---|---|
| 1. | Private Interactions | -.006 | .180 | .140 | .042 | .129 | .156 |
| 2. | Teacher Initiated | .199 | -.042 | -.290 | -.327 | .261 | .048 |
| 3. | Work (Brief + Obs) | .044 | .116 | -.049 | -.028 | .109 | -.189 |
| †4. | Work, Long | .055 | .320 | .002 | -.231 | .329 | .337 |
| 5. | Procedure | .025 | -.280 | -.072 | .031 | .213 | .203 |
| †6. | Behavior, Warn | .252 | -.119 | -.430* | -.346 | .022 | -.251 |
| 7. | Work/Total | -.025 | .034 | .159 | .082 | .167 | .206 |
| 8. | Proc/Total | -.284 | -.219 | .120 | .213 | .096 | .244 |
| 9. | Beh/Total | .191 | -.204 | -.195 | -.230 | -.198 | -.343 |
| 10. | Student Initiated | -.112 | .285 | .320 | .222 | .018 | .162 |
| †11. | Work, Brief | -.238 | .390* | .385* | .433** | .012 | .319 |
| 12. | Work, Long | .075 | .041 | .185 | .047 | .092 | -.030 |
| 13. | Work/Total | -.081 | -.123 | .131 | .444** | .099 | .178 |
| 14. | Work Long/T & S Work | .376* | -.385* | -.173 | -.534** | .158 | -.097 |
| 15. | Work Brief/T & S Work | -.430* | -.074 | .209 | .538** | -.118 | .100 |
| 16. | Public Interactions | .311 | .227 | -.485** | -.289 | .111 | -.057 |
| 17. | Teacher Initiated | .473** | .223 | -.462** | -.402* | .162 | .090 |
| †18. | Self Ref Ques | .421* | -- | .077 | .207 | .036 | .302 |
| 19 | Process To (Pre + N Vol) + Ans | -.032 | -.060 | .251 | .295 | .002 | .238 |
| 20. | Process To (Vol + Call) + Ans | .379* | .230 | -.251 | 0.000 | -.142 | -.226 |
| 21. | (Product + Choice) To (Pre + N Vol) + Ans | -.130 | .299 | -.097 | -.221 | .048 | .393* |
| †22. | (Product + Choice) To (Vol + Call) + Ans | .484** | .327 | -.515** | -.479** | .121 | -.200 |
| | Teacher Feedback | | | | | | |
| †23. | Correct (+) Ans, Affirmed | .520** | .436** | -.574*** | -.363 | -.026 | -.075 |
| 24. | + Ans, No Response | .126 | .175 | .037 | -.230 | .318 | -.097 |
| 25. | Failure to Ans +, Terminated | .122 | -.073 | -.323 | -.699*** | -.122 | -.098 |
| 26. | Failure to Ans +, Sustained | -.109 | -.085 | .113 | -.259 | .057 | .153 |
| †27. | Student Initiated | .164 | .284 | -.417* | -.176 | .063 | -.133 |
| 28. | Totals Private and Public | .152 | .219 | -.155 | -.118 | .137 | .069 |
| 29. | Acad with Praise /Total Work Contacts | -.359 | -.330* | .327 | -.343 | -.002 | .355 |
| 30. | Acad with Criticism /Total Work Contacts | .192 | -.319 | .180 | .107 | -.078 | -.142 |

† Indicates main interaction sequences.

* $.10 \geq p > .05$

** $.05 \geq p > .01$

*** $p \leq .01$

TABLE 29

TEACHER 2 - CORRELATIONS BETWEEN A AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CARDS DATA

| Process Variables | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1. Private Interactions | .197 | -.034 | -.414* | .112 | .058 | .125 | .312 | -.060 | .256 | -.161 | -.321 | -.456** | .565*** | -.389 | .254 | .273 |
| 2. Teacher Initiated | -.114 | .161 | -.352 | .294 | -.271 | .102 | .398* | .038 | .219 | .155 | .112 | -.019 | .075 | -.163 | -.011 | .126 |
| 3. Work (Brief + Obs) | -.020 | .550*** | .062 | .355 | -.261 | -.133 | .104 | -.136 | -.246 | -.168 | .469** | .320 | .273 | -.162 | -.248 | .516** |
| 4. Work, Long | -.236 | .167 | -.216 | .267 | -.374* | -.029 | .264 | .168 | -.186 | -.035 | .319 | .224 | -.006 | .099 | -.203 | .043 |
| 5. Procedure | .080 | -.025 | -.340** | -.043 | -.262 | .165 | .502** | .255 | .107 | -.004 | -.218 | -.168 | .139 | -.021 | .061 | .008 |
| 6. Behavior, Warn | .013 | -.118 | -.069 | .030 | .088 | .189 | .109 | -.038 | .620*** | .343 | -.169 | -.312 | -.121 | -.217 | .267 | -.174 |
| 7. Work/Total | -.155 | .406* | -.131 | .262 | -.125 | -.094 | .060 | -.118 | -.431* | -.155 | .388 | .366 | .110 | -.052 | -.172 | .183 |
| 8. Proc/Total | .177 | -.303 | -.351 | -.123 | -.255 | .154 | .104 | .394* | .057 | .049 | -.252 | -.005 | .159 | .104 | -.101 | .054 |
| 9. Beh/Total | .065 | -.184 | .492** | -.207 | .175 | .040 | -.196 | -.004 | .393* | .127 | -.163 | -.243 | -.267 | -.001 | .238 | -.309 |
| 10. Student Initiated | .296 | -.125 | -.311 | -.020 | .211 | .097 | .165 | -.113 | .193 | -.251 | -.466** | -.538** | .636*** | -.262 | .311 | .262 |
| 11. Work, Brief | .273 | -.091 | -.290 | -.077 | .223 | .097 | -.043 | -.094 | .122 | -.196 | -.429* | -.453** | .672*** | -.107 | .148 | .225 |
| 12. Work, Long | .166 | -.079 | -.384* | -.075 | .087 | .111 | .401* | -.011 | .123 | -.250 | -.463** | -.501** | .560** | -.278* | .422* | .211 |
| 13. Work/Total | .006 | .030 | -.408* | -.094 | .122 | .368 | -.047 | -.056 | .064 | .056 | -.468** | -.304 | .348 | .038 | .164 | -.278 |
| 14. Work, Long/T & S Work | -.291 | -.240 | -.013 | -.126 | -.136 | -.136 | .421* | .248 | -.090 | .007 | .065 | .012 | -.100 | -.209 | .227 | -.135 |
| 15. Work, Brief/T & S Work | .313 | .226 | .025 | .096 | .091 | .070 | -.474** | -.183 | .099 | -.022 | -.040 | -.006 | .206 | .253 | -.252 | .143 |
| 16. Public Interactions | -.115 | -.156 | -.451** | 076 | .412* | -.050 | .124 | -.238 | .541** | .601** | -.349 | -.475** | .298 | -.277 | .121 | .274 |
| 17. Teacher Initiated | -.306 | -.120 | -.488** | .026 | .173 | .040 | .230 | -.045 | .173 | .302 | -.137 | -.251 | .130 | -.333 | .156 | .255 |
| 18. Self Ref Ques | -.080 | -.407* | -.500** | -.144 | -.018 | .362 | -.115 | .271 | -.026 | .143 | -.380* | .006 | .006 | -.395* | .365 | -.229 |
| 19. Process To (Pro + S Vol) + Ans | .136 | -.075 | -.343 | -.022 | .010 | .119 | -.120 | .072 | -.012 | -.093 | -.266 | -.131 | .492*** | -.400* | .144 | .254 |
| 20. Process To (Vol + Call) + Ans | .029 | .100 | .058 | .305 | .376* | .022 | .230 | -.502*** | .166 | -.054 | -.242 | -.192 | -.080 | -.027 | .292 | -.039 |
| 21. (Product + Choice) To (Pro + S Vol) + Ans | -.324 | .293 | -.178 | .101 | .125 | -.256 | .034 | -.176 | -.177 | .120 | .394* | .105 | .241 | 0.14 | -.379* | .532** |
| 22. (Product + Choice) To (Vol + Call) + Ans | -.383* | -.115 | -.085 | .146 | .364 | -.027 | .185 | -.297 | .414* | .389 | -.186 | -.317 | -.017 | -.088 | .081 | -.043 |
| Teacher Feedback | | | | | | | | | | | | | | | | |
| 23. Correct (+) Ans, Affirmed | -.412* | -.187 | -.262 | .235 | .476** | -.031 | .087 | -.428* | .442** | .440** | -.218 | -.248 | .011 | -.178 | .069 | .054 |
| 24. + Ans, No Response | -.019 | .239 | -.027 | .168 | -.085 | .018 | .380 | -.119 | -.175 | -.156 | .211 | -.192 | .347 | .082 | -.345 | .236 |
| 25. Failure to Ans +, Terminated | -.136 | .108 | .005 | .266 | -.124 | -.062 | .298 | -.090 | .026 | .066 | .356 | .031 | -.314 | -.253 | .009 | .427* |
| 26. Failure to Ans +, Sustained | -.196 | .526** | .170 | .379* | -.074 | -.388** | .166 | -.264 | -.241 | -.141 | .608*** | .231 | .435** | .002 | -.441** | .630*** |
| 27. Student Initiated - | .015 | -.156 | -.354 | .083 | .481** | -.083 | .042 | -.350 | .107 | -.094 | -.218 | -.168 | .139 | -.021 | .061 | .358 |
| Totals Private and Public | | | | | | | | | | | | | | | | |
| 28. Acad with Praise / Total Work Contacts | .003 | .092 | .138 | .360 | .230 | -.131 | .028 | -.372* | .179 | .019 | .369 | .078 | -.129 | -.186 | .032 | .030 |
| 29. Acad with Criticism / Total Work Contacts | -.138 | -.256 | -.089 | .302 | -.236 | -.010 | -.083 | .180 | -.168 | -.139 | -.090 | .318 | -.216 | -.168 | .152 | -.180 |

* .10 ≥ p ≥ .05
** .05 ≥ p ≥ .01
*** p ≤ .01

negatively with style A behaviors. It appears that students who exhibit style A behaviors use up their interactions with the teacher in behavior warnings.

Student initiated private interactions correlate positively with style E (adult dependent) behavior and negatively with styles D (peer dependent) and C (withdrawn). Perhaps less attention should be given to the adult dependent in order to encourage independence and more teacher initiated interaction with students when they become peer dependent and/or withdrawn.

2. Public Interactions

Variables relating to the teacher's main public interaction sequences (number 2 and 4 in Figure 14) are positively related to reading achievement, and negatively related to attitudes and self-concept. A noteworthy exception to this inverted pattern is self reference questions.

As expected the public interaction patterns correlate positively with style E (adult dependent) behaviors in teacher directed settings. The students who interacted most often with the teacher (students 1, 19 and 12) also had high style E (adult dependent) coefficients and relatively low style H (other directed, task oriented) coefficients. (Tables 24 and E-2.) The high frequency of interaction may have encouraged a dependency on the teacher.

Students who, in non-teacher directed settings, exhibited style A and B attention getting behaviors were those who interacted most often with the teacher. However even these students had visible behavioral styles that indicated they were independent,

productive and self-directed (style G) most of the time. In fact most of the students in this class were style G.

3. Praise and Criticism

As with teacher 1, teacher 2 used praise to encourage low achievers (see Table 24, pupils 17, 18, 3, and 9).

Criticism was rarely used and neither praise nor criticism correlate significantly with any of the product measures.

## Teacher 3 and Class 3 - Grade 3

The results for teacher and class 3 are reported in Figures 18 to 23 and Tables 27 to 30.

### Figures 18 to 23

a. Private Interactions (.79 in language arts and .51 in mathematics)

The main interaction sequences in language arts and in mathematics were in the private domain. The desks and children were arranged in a U shape in the classroom with a large carpet in the front center open end of the U for doing small group work. The teacher moved very quickly outside the U looking over shoulders at student work, making many observations, brief interactions, many included praise, but most often stopping for long work interactions.

b. Public Interactions (.21 in language arts and .49 in mathematics)

Of the classes studied, class 3 ranks highest in proportion of public interaction initiated by students. Most of these student initiated interactions were relevant comments that were called out and reacted to in a variety of ways by the teacher. As these comments often came while subjects were being introduced, the effect was a reduction in smoothness and momentum. On the other hand, students were encouraged to speak out about how they felt and reacted to the social emotional events of school life. Class 3 scored highest on the satisfaction subscale of the My Class Inventory. What was lost in smoothness and momentum by allowing student initiated public

FIGURE 18

TEACHER NO. 3 IN LANGUAGE ARTS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—159 of 740

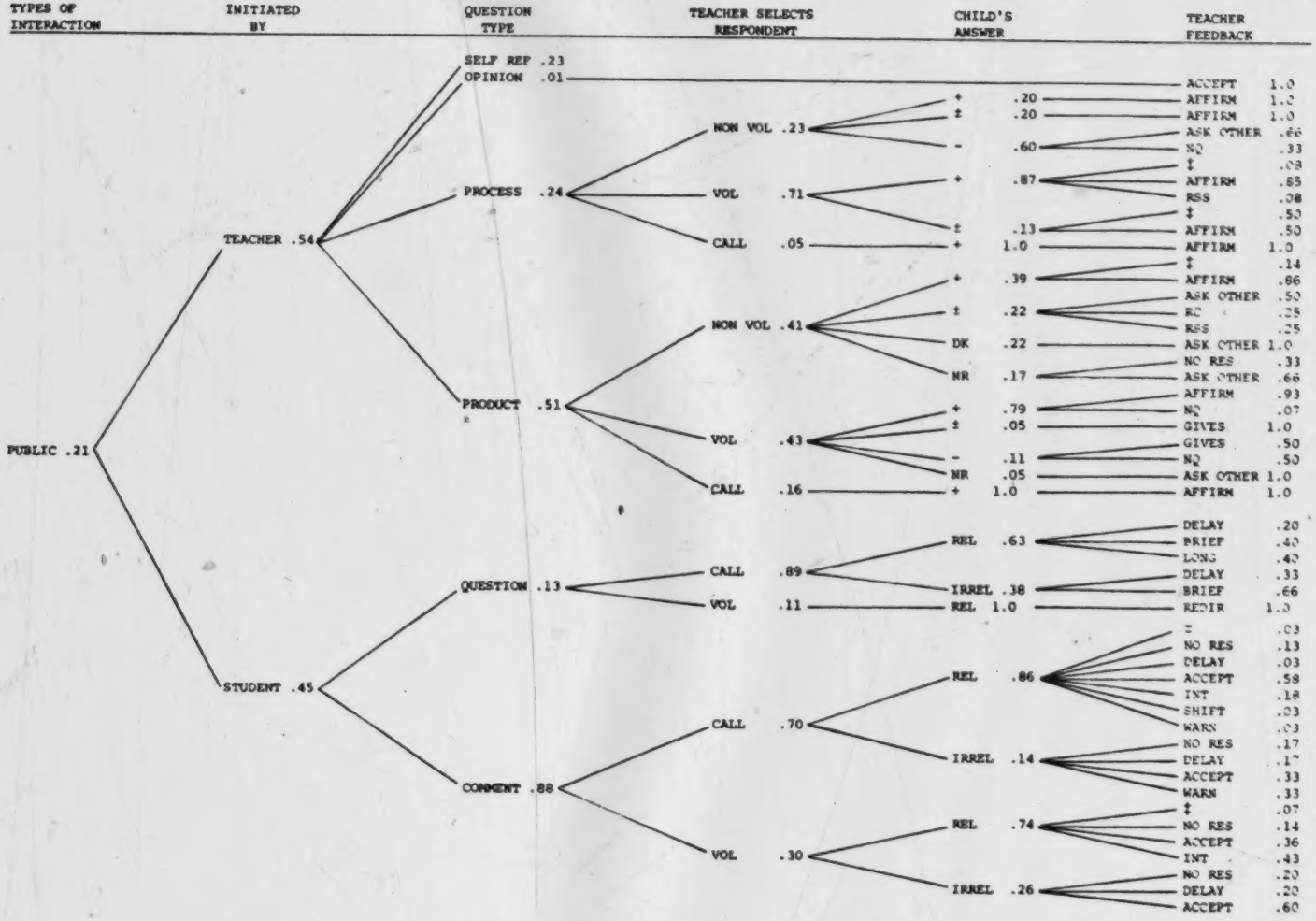


FIGURE 19

TEACHER NO. 3 IN LANGUAGE ARTS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—582 OF 740

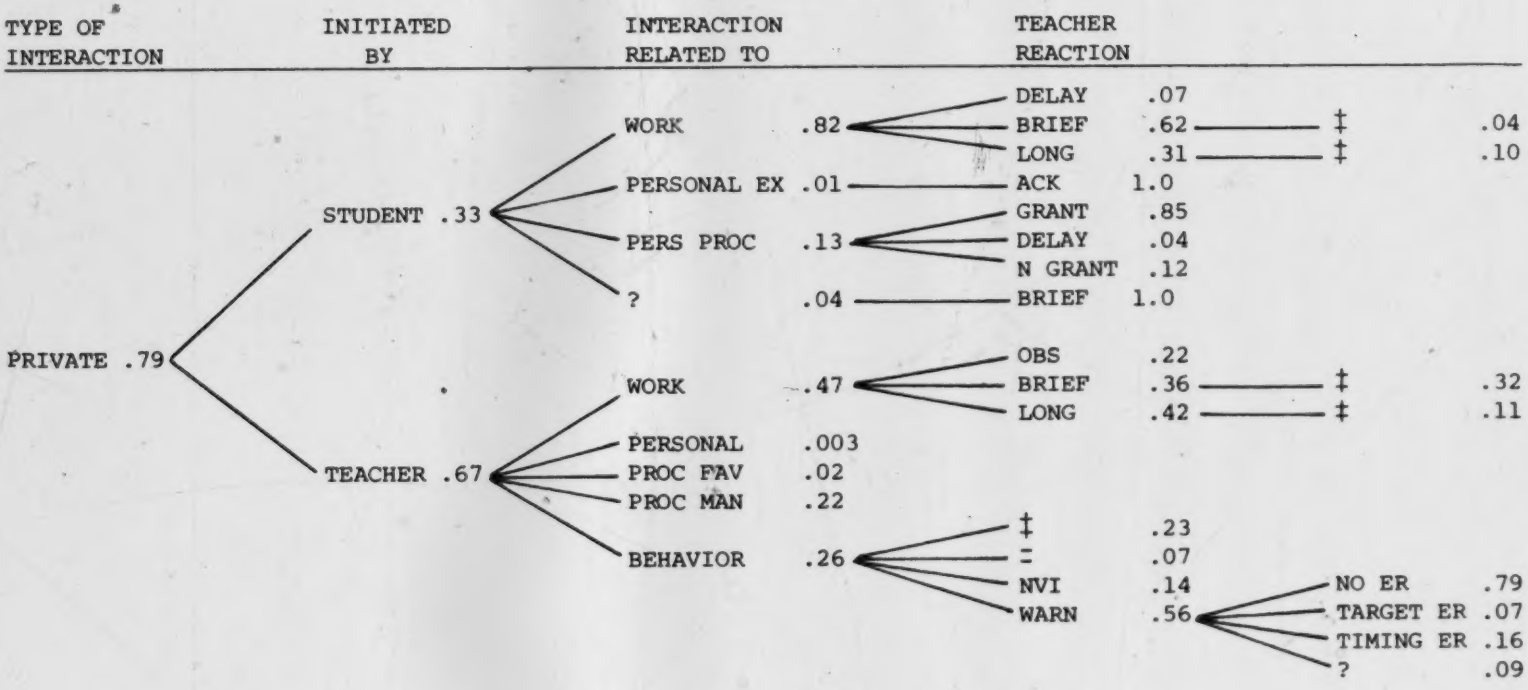


FIGURE 20

TEACHER NO. 3—PROPORTION OF MAIN INTERACTION SEQUENCES IN LANGUAGE ARTS

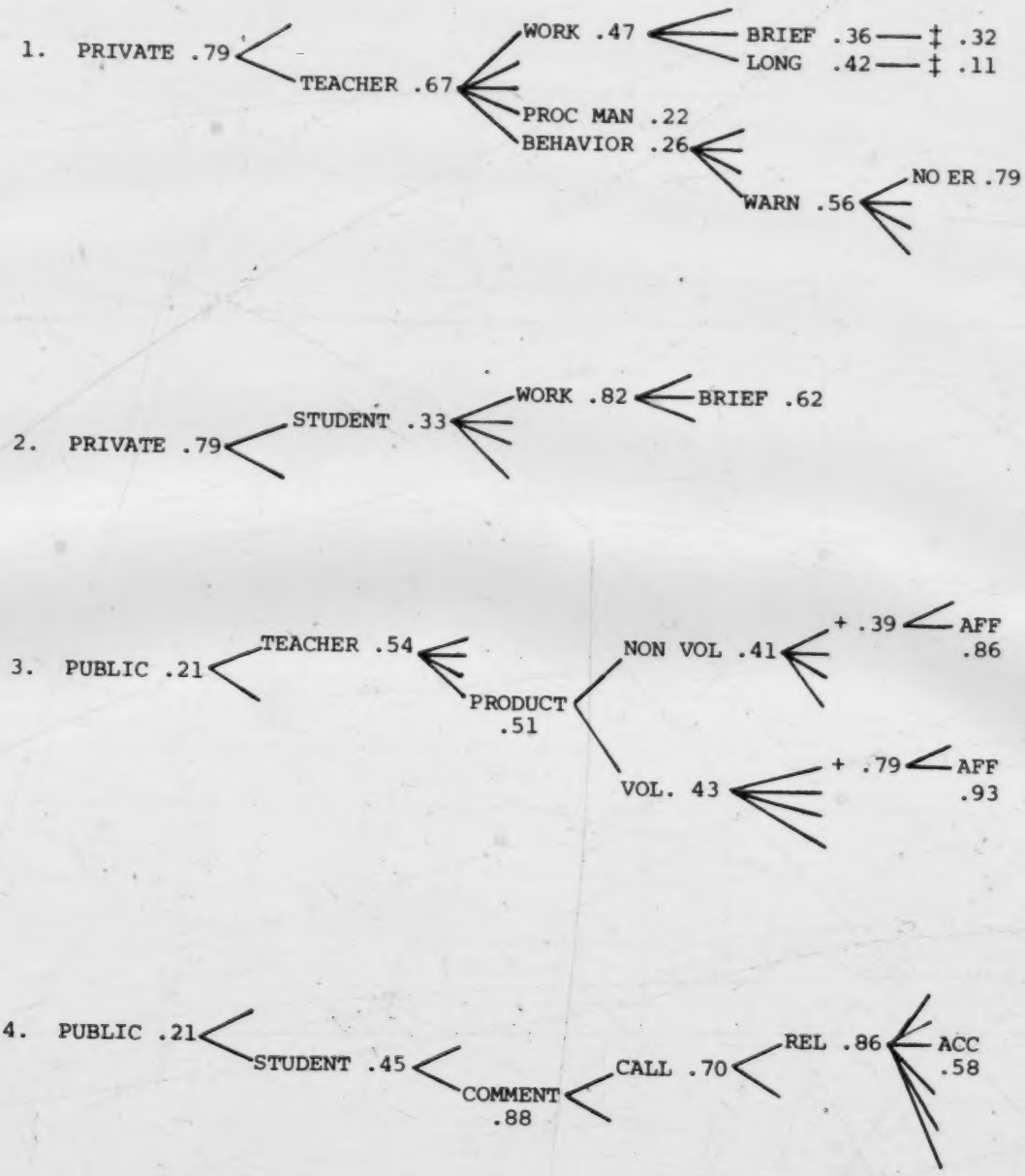


FIGURE 21

TEACHER NO. 3 IN MATHS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—140 OF 285

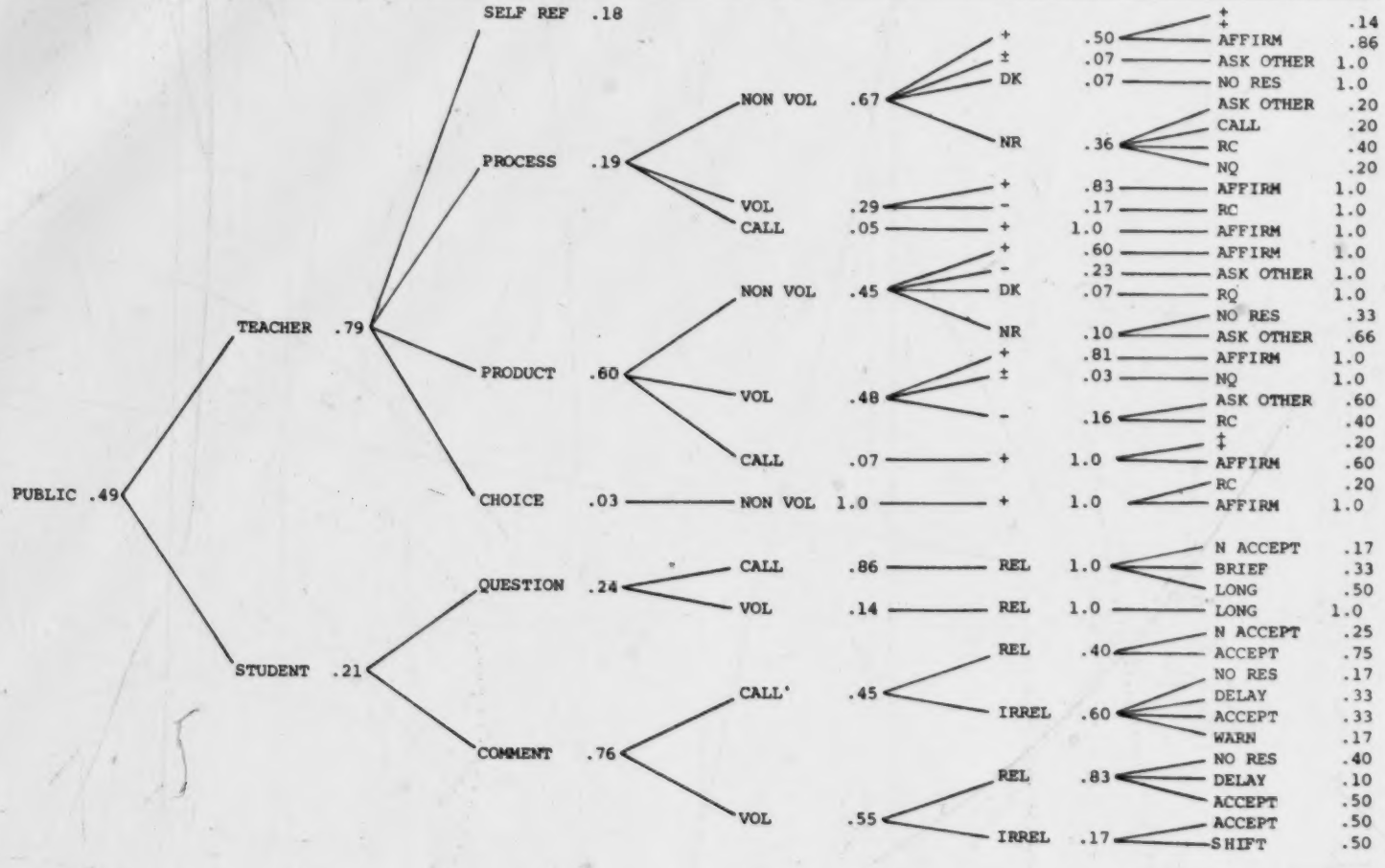


FIGURE 22

TEACHER NO. 3 IN MATHS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—145 of 285

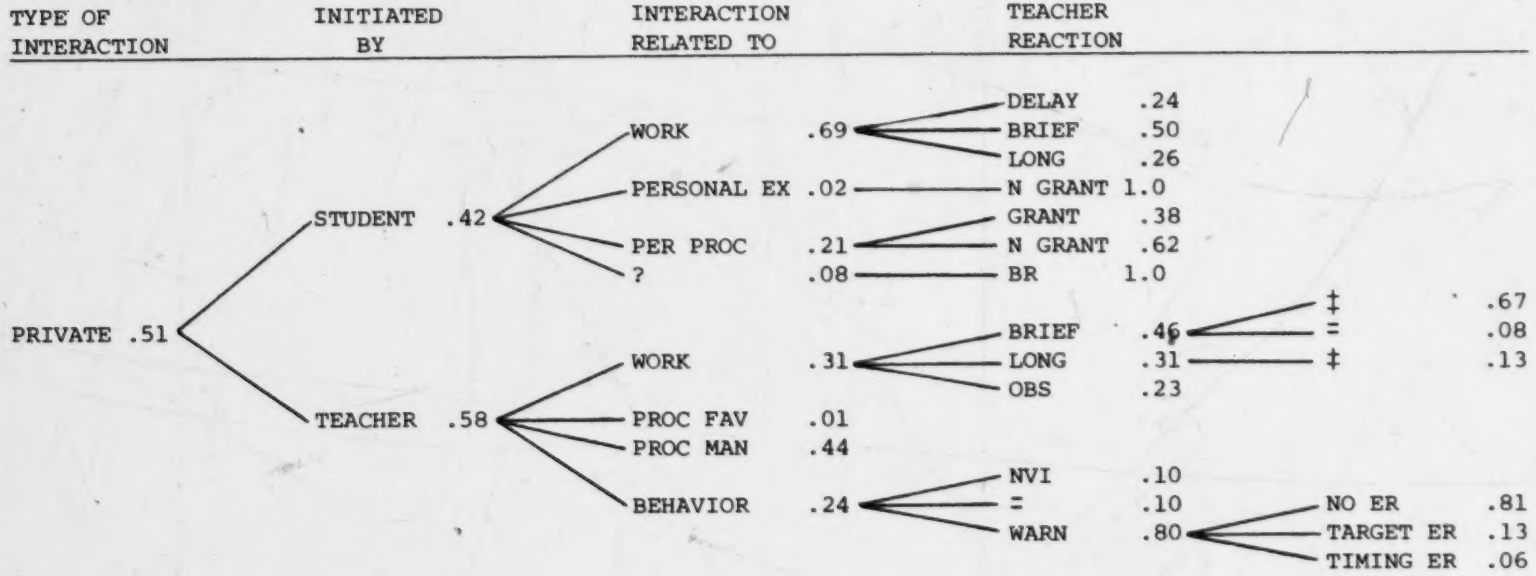
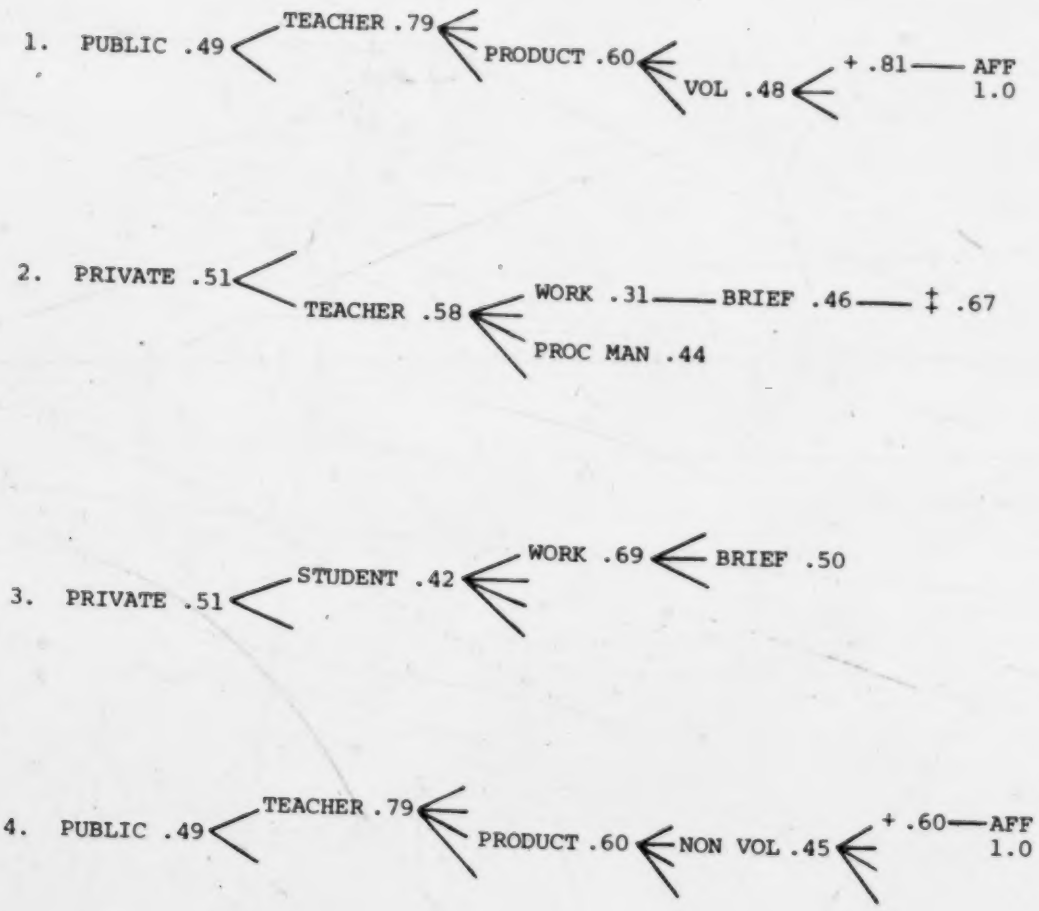


FIGURE 23

TEACHER NO. 3—PROPORTION OF MAIN INTERACTION SEQUENCES IN MATHEMATICS



interaction appears to be gained in student satisfaction with classroom life. The teacher reported "I believe education is more than academic, it's also a social thing and an emotional thing so we often have times to discuss problems." Teacher 3 also scored highest on empathy.

Table 27

Low achievers had more private interactions with the teacher than highs, even though the highs initiated slightly more interactions with the teacher than the lows. Public interactions, both teacher and student initiated, favored the highs.

Table 28

It is difficult to see any strong patterns emerging from Table 28 when tracing the high and low achievers. This observation is supported by the few correlations found between interaction and product measures (Table 29). Some students, however, are worth noting. There are 10 students in class 3 who initiated no public interactions. In addition, four students were not asked any questions and, as a result, had no public dyadic interactions. One of the four is among the low achievers and another ranks lowest on the Children's Attitude Inventory (CAI). The four students also rank in the mid- to high-range on self-concept. Lack of public interactions does not appear to be related to low achievement, attitudes or self-concept in this class. With the exception of student 31 (who joined the class during the first day of observations), the teacher appears to compensate the other three students (30, 8 and 20) with frequent teacher

TABLE 27

TEACHER 3 - B AND E PROCESS VARIABLES AND FREQUENCY OF INTERACTION FOR HIGH AND LOW ACHIEVERS ON THE MAT TOTAL READING SUBTEST

| Process Variables | Frequence of Interaction | | | |
|---|---|---|---|---|
| | Totals | Totals N = 31 | $\bar{x}$ for Hi Ach | $\bar{x}$ for Lo Ach |
| 1. Private Interactions | 563.60 | 18.18 | 19.07 | 19.40 |
| 2. Teacher Initiated | 367.91 | 11.87 | 12.24 | 13.12 |
| *3. Work (Brief + Obs) | 107.26 | 3.46 | 2.33 | 3.56 |
| 4. Work, Long | 77.50 | 2.50 | 2.83 | 2.94 |
| 5. Procedure | 97.95 | 3.16 | 3.04 | 3.37 |
| *6. Behavior, Warn | 61.00 | 1.97 | 2.83 | 2.00 |
| 7. Student Initiated | 195.70 | 6.31 | 6.83 | 6.28 |
| *8. Work, Brief | 100.13 | 3.23 | 4.29 | 3.62 |
| 9. Work, Long | 49.29 | 1.59 | 1.00 | 1.41 |
| 10. Public Interactions | 156.72 | 5.06 | 5.29 | 3.78 |
| 11. Teacher Initiated | 87.23 | 2.81 | 2.92 | 2.28 |
| 12. Self Ref Ques | 20.00 | .65 | .17 | .88 |
| 13. Process To (Pre + N Vol) + Ans | 1.00 | .032 | 0.0 | 0.0 |
| 14. Process To (Vol + Call) + Ans | 14.24 | .46 | 1.04 | .88 |
| *15. (Product + Choice) To (Pre + N Vol) + Ans | 7.00 | .23 | .67 | 0.0 |
| *16. (Product + Choice) To (Vol + Call) + Ans | 22.00 | .71 | .67 | .25 |
| Teacher Feedback | | | | |
| *17. + Ans, Affirmed | 40.24 | 1.30 | 2.21 | .38 |
| 18. + Ans, No Response | -- | -- | -- | -- |
| 19. Failure to Ans +, Term | 14.57 | .47 | .71 | .50 |
| 20. Failure to Ans +, Sus | 4.34 | .14 | .50 | .13 |
| 21. Student Initiated | 69.49 | 2.24 | 2.04 | 1.50 |
| *22. Comment | 60.49 | 2.00 | 1.87 | 1.25 |
| *23. Comm + Ques Accepted | 53.32 | 1.72 | 1.37 | 1.25 |

*Indicates the main interaction sequences.

TABLE 28

STUDENTS OF TEACHER 3, RANK ORDERED BY FREQUENCY AND PROPORTION OF INTERACTION, ACHIEVEMENT SCORES, ATTITUDE SCORES AND FREQUENCY OF DISCIPLINE PROBLEMS AND ABSENTEEISM

| | Frequency of Interactions | | | | | | | Interaction Proportions | | | | | Achievement | Attitudes | Self-concept | Behaviors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Private | | | Public | | | Total Public & Private | | | Private | | | | | | |
| Rank Order | Total Priv & Pub Interactions | Total | Teacher Initiated | Student Initiated | Total | Teacher Initiated | Student Initiated | Acad Total | Acad with Praise Total Work | Acad with Crit Total Work | Work Long Total Work | Work Brief Total Work | MAT Total Reading | CAI Total Score | SEI Sch-Ach Subscale | No of Disc | Absenteeism |
| Totals | 720.33 | 563.60 | 367.91 | 195.70 | 156.72 | 87.23 | 69.49 | | | | | | | | | | |
| High Score | 48.00 | 34.00 | 27.00 | 18.00 | 18.00 | 8.00 | 11.00 | .92 | .31 | .04 | .67 | 1.00 | 94 | 75 | 16 | 3 | 24.5 |
| 1 | 25 | 25 | 21 | 10 | 3 | 12 | 3 | 26 | 15 | 3 | 13 | 14 | 9 | 9 | 31 | 13 | 5 |
| 2 | 4 | 21 | 25 | 2 | 9 | 3 | 9 | 5 | 11 | * | 3 | 6 | 22 | 1 | 9 | 27 | 18 |
| 3 | 3 | 10 | 13 | 4 | 25 | 9 | 25 | 6 | 27 | | 23 | 19 | 28 | 16 | 19 | 25 | 8 |
| 4 | 10 | 4 | 27 | 22 | 12 | 25 | 4 | 9 | 1 | | 17 | 1 | 24 | 28 | 20 | 20 | 23 |
| 5 | 21 | 2 | 3 | 25 | 4 | 4 | 7 | 23 | 31 | | 12 | 28 | 17 | 8 | 3 | 30 | 14 |
| 6 | 9 | 13 | 4 | 18 | 10 | 10 | 12 | 12 | 18 | | 8 | 22 | 21 | 10 | 13 | 5 | 30 |
| 7 | 13 | 27 | 8 | 23 | 13 | 24 | 13 | 10 | 8 | | 5 | 2 | 2 | 19 | 26 | 4 | 19 |
| 8 | 2 | 3 | 7 | 5 | 24 | 13 | 6 | 22 | 16 | | 25 | 30 | 12 | 6 | 12 | 17 | 10 |
| 9 | 7 | 22 | 20 | 15 | 5 | 5 | 10 | 31 | 25 | | 21 | 27 | 5 | 23 | 10 | 1 | 2 |
| 10 | 12 | 8 | 29 | 30 | 7 | 23 | 2 | 28 | 29 | | 9 | 11 | 4 | 4 | 1 | * | 31 |
| 11 | 24 | 7 | 24 | 1 | 6 | 1 | 18 | 7 | 21 | | 7 | 31 | 15 | 13 | 14 | | 11 |
| 12 | 27 | 1 | 17 | 28 | 29 | 15 | 28 | 14 | 23 | | 24 | 26 | 6 | 31 | 16 | | 20 |
| 13 | 1 | 24 | 10 | 11 | 15 | 29 | 29 | 3 | 3 | | 15 | 20 | 3 | 21 | 5 | | 26 |
| 14 | 5 | 18 | 1 | 9 | 23 | 14 | 5 | 11 | 7 | | 18 | 4 | 26 | 12 | 7 | | 9 |
| 15 | 29 | 17 | 2 | 7 | 2 | 17 | 14 | 4 | 5 | | 16 | 16 | 8 | 2 | 8 | | 29 |
| 16 | 17 | 30 | 30 | 21 | 1 | 6 | 17 | 2 | 26 | | 4 | 29 | 18 | 25 | 29 | | 21 |
| 17 | 18 | 29 | 19 | 26 | 14 | 19 | 24 | 15 | 24 | | 20 | 15 | 25 | 20 | 11 | | 22 |
| 18 | 22 | 11 | 12 | 16 | 17 | 2 | 1 | 8 | 6 | | 31 | 24 | 29 | 26 | 22 | | 12 |
| 19 | 8 | 15 | 11 | 24 | 28 | 27 | 16 | 29 | 4 | | 11 | 7 | 23 | 5 | 28 | | 1 |
| 20 | 15 | 23 | 6 | 17 | 19 | 7 | 19 | 27 | 10 | | 10 | 10 | 30 | 18 | 30 | | 16 |
| 21 | 23 | 5 | 15 | 8 | 18 | 11 | 15 | 1 | 30* | | 27 | 9 | 19 | 29 | 17 | | 17 |
| 22 | 11 | 20 | 5 | 29 | 27 | 22 | 30* | 30 | 2 | | 29 | 5 | 14 | 7 | 18 | | 25 |
| 23 | 30 | 28 | 22 | 13 | 16 | 21 | 11 | 18 | 28 | | 30 | 25 | 31 | 14 | 23 | | 3 |
| 24 | 6 | 9 | 18 | 27 | 11 | 16 | 31 | 24 | 22 | | 26 | 21 | 7 | 22 | 2 | | 13 |
| 25 | 28 | 19 | 14 | 3 | 26 | 18 | 8 | 16 | 9 | | 2 | 18 | 20 | 17 | 4 | | 6 |
| 26 | 20 | 12 | 23 | 14 | 21 | 28 | 22 | 19 | 13 | | 28 | 8 | 16 | 3 | 6 | | 7 |
| 27 | 19 | 26 | 26 | 20 | 22 | 26 | 23 | 20 | 14 | | 19 | 12 | 1 | 11 | 21 | | 4 |
| 28 | 14 | 6 | 9 | 19 | 30* | 31* | 26 | 17 | 12 | | 22 | 17 | 13 | 27 | 24 | | 27 |
| 29 | 26 | 16 | 28 | 31 | 31 | 20 | 21 | 13 | 19 | | 6 | 3 | 27 | 24 | 25 | | 28 |
| 30 | 16 | 14 | 31 | 6 | 8 | 30 | 20 | 25 | 20 | | 1 | 23 | 11 | 15 | 15 | | 15* |
| 31 | 31 | 31 | 16 | 12 | 20 | 8 | 27 | 21 | 17 | | 14* | 13 | 10 | 30 | 27 | | 24 |
| Low Score | 8.00 | 8.00 | 6.00 | 2.00 | 0.0 | 0.0 | 0.0 | .41 | 0.0 | 0.0 | 0.0 | .22 | 52 | 34 | 4 | 0 | 0 |
| X Score | 23.24 | 18.18 | 11.87 | 6.31 | 5.06 | 2.81 | 2.24 | .66 | .09 | .001 | .37 | .61 | 71.94 | 58.55 | 9.74 | .45 | 7.37 |

*Indicates when score of zero (0) begins.

initiated private interactions.

No one student or group of students appears to dominate interaction. The fluid membership in groups and the quick pace of the teacher in moving around the room seems to account for this observation.

Tables 29 and 30

1. Private Interactions

Only those correlations, in Table 29, significant to the .05 level or better will be discussed. (Note: In Table 29 - excluding maths, there are 150 correlations of which 15 are significant at the .10 level.)

Procedural interactions correlate negatively with pupil attitudes, total private interactions correlate negatively with self-concept, and teacher initiated interactions and behavior warnings correlate positively with discipline visits to the office. In addition Table 30 reveals that long private interactions correlate positively with style A (aggressive manipulative), style B (peer oriented, non-conforming) and style D (peer dependent, distractable) behaviors. An examination and comparison of Tables 28 and E-3 (Appendix E) reveal that the students who had discipline visits to the office also frequently exhibit style A, B and/or D behaviors.

It appears therefore that the teacher's procedural and behavioral interactions and the long attention given these students had negative effects in terms of attitudes, self-concept and behavioral styles.

Private interactions that were student initiated and given

TABLE 29

TEACHER 3 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

| | Process Variables | MAT Total Reading | MAT Total Math | CAI Total Score | SEI Sch-Ach Subscale | Discipline Visits to Office | Absenteeism |
|---|---|---|---|---|---|---|---|
| 1. | Private Interactions | -.024 | -.066 | -.032 | -.396** | .331* | -.131 |
| 2. | Teacher Initiated | -.082 | -.188 | -.095 | -.262 | .484*** | -.298 |
| †3. | Work (Brief + Obs) | -.235 | -.305* | -.113 | -.264 | -.034 | -.043 |
| †4. | Work, Long | -.049 | -.145 | -.096 | .048 | .278 | -.233 |
| 5. | Procedure | -.092 | .101 | -.361** | -.133 | .206 | -.076 |
| 6. | Behavior, Warn | .042 | -.122 | .162 | -.190 | .415** | -.283 |
| 7. | Work/Total | -.055 | -.259 | -.050 | .103 | -.237 | .083 |
| 8. | Proc/Total | .003 | .038 | -.263 | -.080 | -.157 | .162 |
| 9. | Beh/Total | .032 | -.212 | .219 | -.066 | .350* | -.286 |
| 10. | Student Initiated | .068 | .144 | .073 | -.315* | -.088 | .174 |
| †11. | Work, Brief | .156 | .295 | .107 | -.214 | -.104 | -.017 |
| 12. | Work, Long | -.015 | .020 | .091 | -.241 | -.110 | .349* |
| 13. | Work/Total | -.038 | .029 | .257 | -.091 | -.025 | .035 |
| 14. | Work Long/T & S Work | .058 | -.121 | -.075 | .063 | .248 | -.026 |
| 15. | Work Brief/T & S Work | .014 | -.025 | .024 | -.100 | -.257 | -.033 |
| 16. | Public Interactions | .209 | -.198 | .122 | .137 | .067 | -.248 |
| 17. | Teacher Initiated | .198 | -.310* | .075 | .072 | .075 | -.221 |
| 18. | Self Ref Ques | -.233 | -.300 | .031 | -.185 | .395** | -.165 |
| 19. | Process To (Pre + N Vol) + Ans | .084 | -.234 | -.028 | .127 | .126 | .515*** |
| 20. | Process To (Vol + Call) + Ans | .395** | -.270 | .149 | .154 | -.173 | -.184 |
| †21. | (Product + Choice) To (Pre + N Vol) + Ans | .272 | -.060 | -.201 | -.112 | -.232 | -.150 |
| †22. | (Product + Choice) To (Vol + Call) + Ans | .206 | .016 | .225 | .206 | -.175 | -.227 |
| | Teacher Feedback | | | | | | |
| 23. | Correct (+) Ans, Affirmed | .407** | -.145 | .184 | .226 | -.265 | -.206 |
| 24. | + Ans, No Response | -- | -- | -- | -- | -- | -- |
| 25. | Failure to Ans +, Terminated | -.070 | -.159 | -.051 | .079 | .206 | .355** |
| 26. | Failure to Ans +, Sustained | .130 | -.164 | -.274 | -.009 | .100 | -.151 |
| †27. | Student Initiated | .195 | .197 | .146 | .174 | .055 | -.243 |
| 28. | Totals Private and Public | .093 | -.173 | .042 | -.211 | .272 | -.225 |
| 29. | Acad with Praise / Total Work Contacts | -.335* | -.128 | -.158 | -.333* | -.097 | -.016 |
| 30. | Acad with Criticism / Total Work Contacts | .018 | .069 | -.190 | .240 | -.103 | -.147 |

† Indicates main interaction sequences.

* $.10 \geq p > .05$
** $.05 \geq p > .01$
*** $p \leq .01$

TABLE 30

TEACHER 3 - CORRELATIONS BETWEEN B AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

| Process Variables | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1. Private Interactions | .075 | .365** | -.102 | .007 | -.052 | -.109 | -.250 | -.057 | -.073 | .023 | .179 | -.020 | .632*** | .190 | -.342* | -.905 |
| 2. Teacher Initiated | .030 | .472*** | -.126 | .032 | -.148 | .020 | -.164 | -.094 | -.117 | .075 | .329* | .024 | .279 | .125 | -.260 | .083 |
| 3. Work (brief + Obs) | -.216 | .248 | .012 | .486*** | -.183 | .119 | .188 | -.361** | .069 | -.243 | -.072 | -.003 | -.045 | .152 | .136 | -.081 |
| 4. Work, Long | .022 | .359** | -.135 | -.209 | .031 | .066 | -.221 | -.021 | -.130 | .199 | .294 | .083 | .276 | -.155 | -.171 | -.068 |
| 5. Procedure | -.015 | .165 | .110 | -.123 | -.099 | -.165 | -.238 | .150 | -.194 | .083 | -.044 | .210 | .107 | -.014 | -.125 | -.196 |
| 6. Behavior, Warn | .175 | .220 | -.124 | -.035 | -.056 | .010 | -.028 | -.046 | .001 | .095 | .348* | -.049 | .281 | .102 | -.274 | .078 |
| 7. Work/Total | -.135 | .119 | .137 | .248 | -.029 | .222 | .060 | -.262 | .236 | -.118 | -.128 | .072 | -.100 | -.198 | .210 | -.719 |
| 8. Proc/Total | -.015 | -.149 | .137 | -.258 | .003 | -.207 | -.139 | .292 | -.136 | .028 | -.235 | .187 | -.021 | .634 | -.646 | -.166 |
| 9. Beh/Total | .160 | -.013 | -.238 | -.003 | .064 | -.010 | .102 | -.050 | -.105 | .138 | .351* | -.218 | .155 | .670 | -.171 | .169 |
| 10. Student Initiated | .085 | -.016 | -.004 | -.030 | .110 | -.208 | -.200 | .029 | .034 | -.061 | -.137 | -.078 | .685*** | .151 | -.027 | .191 |
| 11. Work, Brief | -.135 | -.092 | .005 | -.020 | .147 | -.199 | -.228 | .066 | -.114 | -.008 | -.211 | -.212 | .498** | .121 | -.018 | -.093 |
| 12. Work, Long | .458*** | -.047 | -.025 | -.052 | .077 | -.235 | .075 | -.058 | .064 | -.119 | -.037 | .225 | .350* | .014 | -.270 | .289 |
| 13. Work/Total | .222 | -.090 | .102 | -.143 | .068 | -.371** | .228 | -.070 | -.318* | -.127 | -.121 | .195 | .053 | -.096 | .094 | -.163 |
| 14. Work, Long/T & S Work | -.065 | -.085 | -.079 | -.175 | .150 | -.038 | -.046 | .038 | .012 | .199 | .311* | .341* | .160 | -.225 | -.328* | .175 |
| 15. Work, Brief/T & S Work | -.492*** | -.159 | .138 | .350* | -.145 | -026 | .082 | .004 | .066 | -.136 | -.280 | .316* | -.267 | .169 | .332* | -.124 |
| 16. Public Interactions | .241 | .014 | -.103 | -.255 | .102 | .050 | .038 | .028 | -.128 | .148 | .598*** | .074 | .263 | -.191 | -.223 | .130 |
| 17. Teacher Initiated | .320* | .039 | -.073 | -.207 | .073 | -.014 | .023 | .009 | -.183 | .154 | .530*** | .071 | .262 | -.213 | -.241 | .259 |
| 18. Self Ref Ques | .027 | .334* | .097 | .083 | -.152 | -.029 | -.021 | -.148 | .196 | -.017 | .181 | .327* | .651*** | .020 | -.387** | -.101 |
| 19. Process To (Pre + H Vol) + Ans | -.065 | .047 | -.075 | -.067 | -.017 | -.094 | -.046 | .071 | -.087 | .330* | .358** | -.044 | -.051 | -.098 | -.221 | .169 |
| 20. Process To (Vol + Call) + Ans | .334* | -.234 | -.075 | -.208 | .180 | .014 | .111 | .051 | -.041 | -.025 | .307* | .036 | -.124 | -.078 | -.004 | .115 |
| 21. (Product + Choice) To (Pre + H Vol) + Ans | -.146 | -.209 | -.099 | -.025 | .110 | .195 | -.066 | .110 | -.196 | -.019 | .015 | -.113 | -.178 | .095 | .181 | .051 |
| 22. (Product + Choice) To (Vol + Call) + Ans | .150 | -.096 | -.299 | -.332* | .197 | .044 | .139 | .062 | -.166 | .095 | .302* | -.030 | .070 | -.185 | -.023 | .131 |
| Teacher Feedback | | | | | | | | | | | | | | | | |
| 23. Correct (+) Ans, Affirmed | .239 | -.293 | -.221 | -.350* | .288 | .133 | .099 | .112 | -.175 | .061 | .412** | -.065 | -.058 | -.169 | .032 | .117 |
| 24. + Ans, No Response | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 25. Failure to Ans +, Terminated | .294 | .203 | .193 | -.071 | -.100 | -.110 | -.117 | -.008 | -.203 | .242 | .311* | -.150 | .070 | -.098 | -.170 | .326* |
| 26. Failure to Ans +, Sustained | .122 | .006 | .189 | .057 | -.153 | -.161 | -.084 | .104 | -.149 | .145 | .169 | -.078 | -.063 | -.134 | -.051 | .274 |
| 27. Student Initiated | .154 | -.008 | -.116 | -.265 | .113 | .095 | .045 | .040 | -.071 | .129 | .587*** | .068 | .235 | -.134 | -.185 | .015 |
| Totals Private and Public | | | | | | | | | | | | | | | | |
| 28. Acad with Praise / Total Work Contacts | -.138 | .081 | .016 | .265 | -.158 | .368** | .079 | -.092 | .081 | -.286 | -.116 | .363* | -.089 | .260 | -.066 | -.253 |
| 29. Acad with Criticism / Total Work Contacts | -.065 | -.085 | -.079 | -.175 | .150 | .412** | -.046 | .038 | -.087 | .152 | .418** | .051 | .035 | -.434 | -.138 | -.145 |

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

brief attention correlate positively with style E (adult dependent) in non teacher-directed settings.

2. Public Interactions

Two interesting relationships with public interaction variables are the correlations between (1) self reference questions and number of discipline visits, and (2) process questions asked of preselects and non-volunteers and absenteeism. The teacher apparently had students with behavioral difficulties talk about personal experiences. The teacher also preselected or called on those students who had been absent frequently.

Style C (withdrawn) behaviors in non-teacher directed settings apparently were recognized and frequent public interactions were both allowed and initiated by the teacher.

The majority of the students in class 3 were style H (other-directed, task oriented) in teacher directed settings and style G (inner-directed, task oriented) in non-teacher directed settings. But a comparison between Tables E-3 and E-4 (Appendix E), the cases styles coefficients (the two grade three classes), reveals that students in class 3 exhibited more style B, C, and D behaviors in both teacher directed and non-teacher directed settings than students in class 4.

## Teacher 4 and Class 4 - Grade 3

The results for teacher and class 4 are reported in Figures 24 to 29, and Tables 31 to 34.

### Figures 24 to 29

a. Public Interactions (.67 in language arts and .45 in mathematics)

Teacher 4 and teacher 6 had higher proportions of public interactions than private interactions. Only 14 percent of teacher 4's public interactions were student initiated (lowest of the six teachers). The main sequence was repetitious and the pace of the sequence was at times extremely rapid. The sequence was: product question—volunteer—correct answer—affirmed. Incorrect answers were usually given no feedback by the teacher and/or another student was asked in an attempt to find the correct answer. This very dominant sequence led to teacher centered recitation type lessons. Calling on volunteers a high proportion of the time led to students waving hands, straining to be chosen for an attempt at the questions.

The teacher not only controlled who spoke but what was acceptable information given. The teacher had in mind what the correct answers to the questions were and moved from student to student until the correct answer was given. This pattern was used not only with the low level (product or choice) questions, where it might be expected, but was used with process questions as well (see Figure 26, number 4). The pattern was dominant in both language arts and mathematics lessons, in drill lessons, and in interpretation

FIGURE 24

TEACHER NO. 4 IN LANGUAGE ARTS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—630 of 957

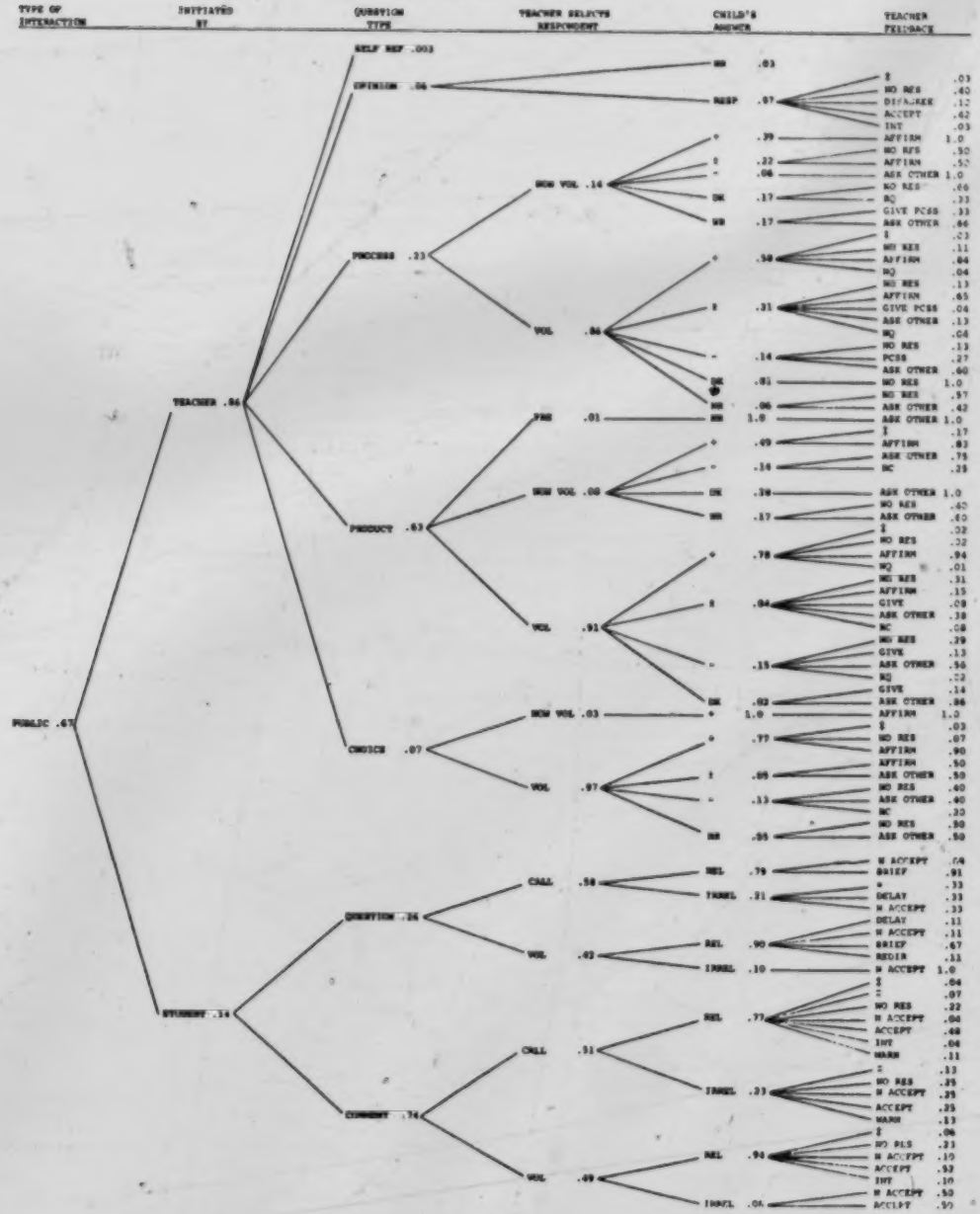


FIGURE 25

TEACHER NO. 4 IN LANGUAGE ARTS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—319 OF 957

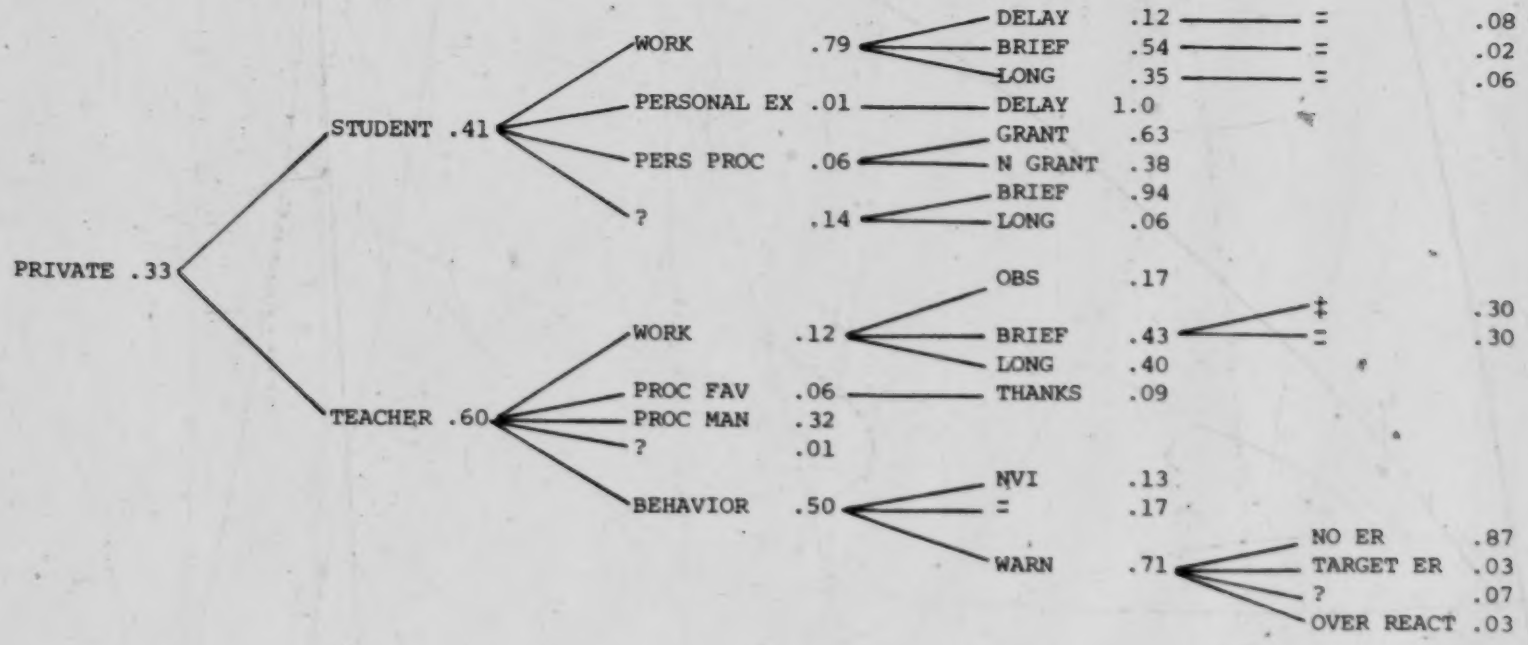


FIGURE 26

TEACHER NO. 4—PROPORTION OF MAIN INTERACTION SEQUENCES IN LANGUAGE ARTS

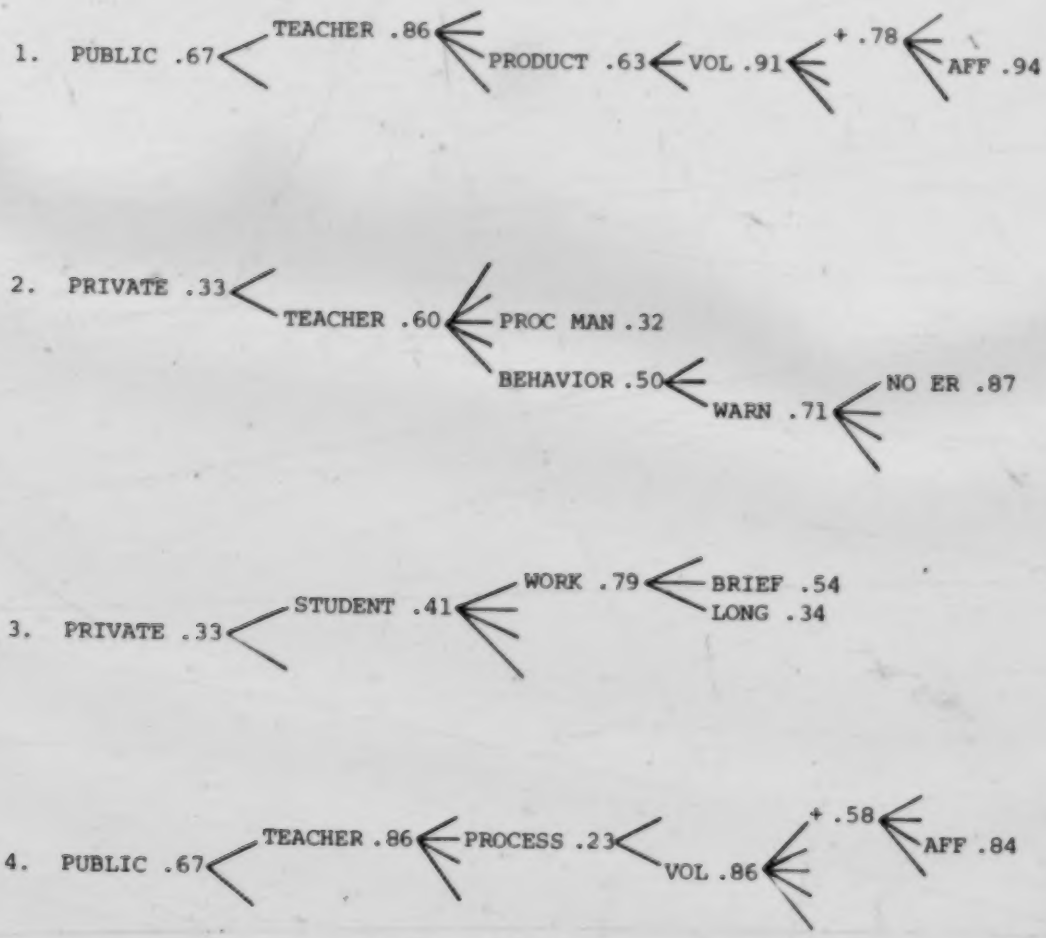


FIGURE 27

TEACHER NO. 4 IN MATHS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—150 OF 331

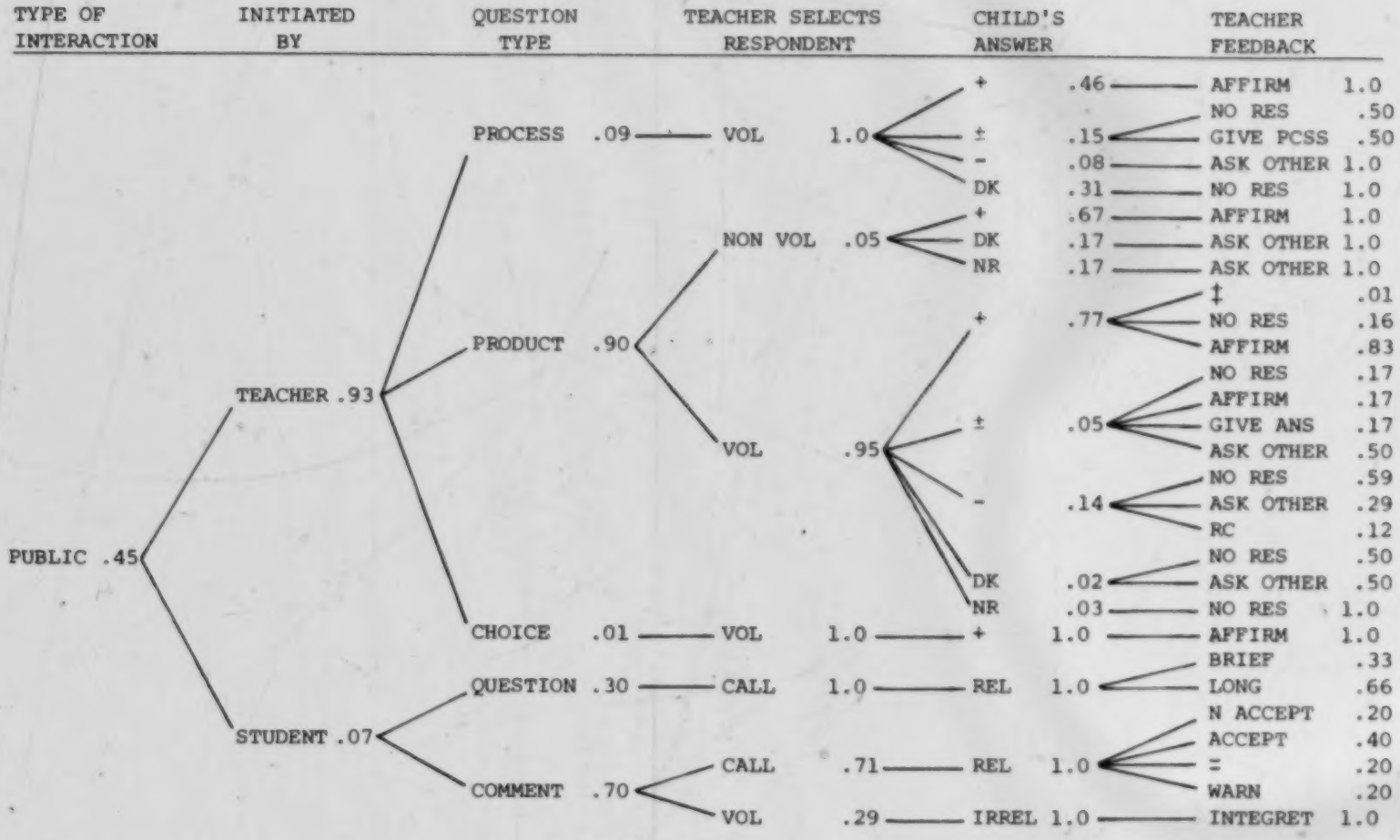


FIGURE 28

TEACHER NO. 4 IN MATHS
NATURE OF PRIVATE INTERACTIONS—PROPORTIONS
NO. OF PRIVATE INTERACTIONS—181 of 331

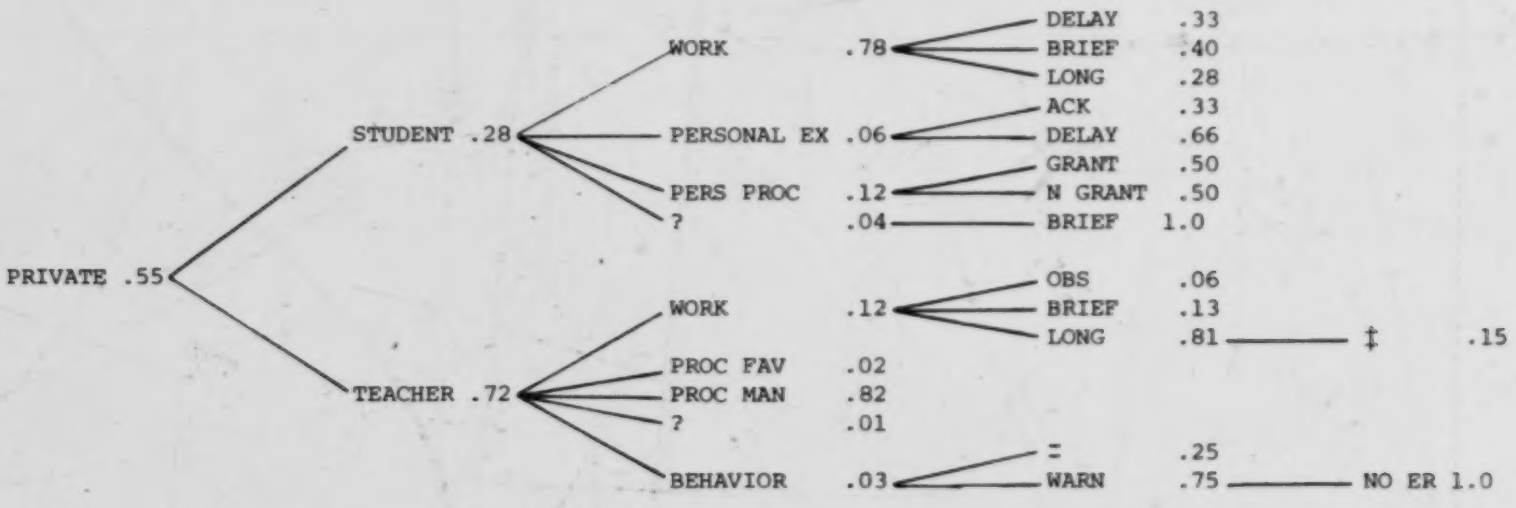
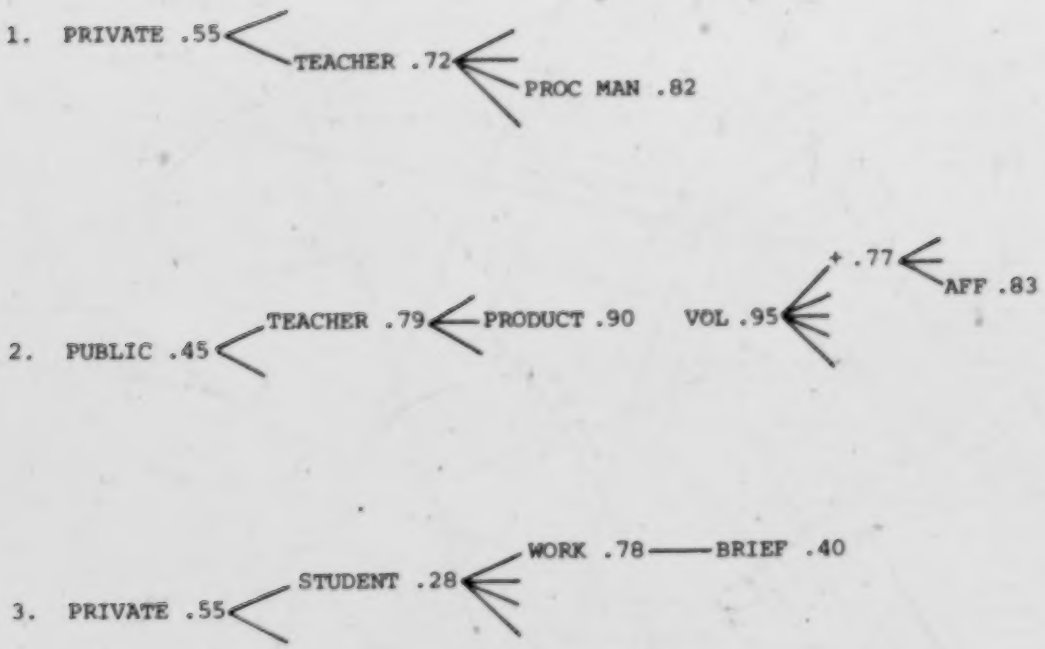


FIGURE 29

TEACHER NO. 4—PROPORTION OF MAIN INTERACTION SEQUENCES IN MATHEMATICS



lessons.

The sequence used by teacher 4 indicates that the teacher had certain facts in mind that had to be covered. The teacher used two cues to determine how well the material had been covered. The cues were, (1) the number of raised hands by students who wanted to be chosen to answer the question and (2) the simple recitation of the facts by the students.

The sequence may be appropriate for drill lessons in language arts and mathematics but must certainly be inappropriate for interpretation lessons. Some of the thinking skills listed in the Language Experience Reading Program (Thorn et al, 1967) are recognizing relationships, sensing emotional reactions, forming sensory impressions, predicting outcomes, inferring, making judgements, and drawing conclusions.

If some of these thinking skills are to be encouraged through discussion in reading groups then a different set of instructional skills from those appropriate for recitation or drill lessons must be used. A higher proportion of pupil comments and questions, frequent use of self reference, opinion and process questions, frequent probing of ideas by sustaining responses, would be more appropriate strategies for use in language arts interpretation lessons.

b. Private Interactions (.33 in language arts and .55 in mathematics)

In both language arts and mathematics, the main sequences for private interactions involved teacher initiated procedural comments and behavior warnings. Interactions that students initiated received brief attention by the teacher. These sequences were used for control

purposes in order to keep students on task and together.

Table 31

The frequence of private interactions favor the low achievers but the nature of these interactions was most often procedural comments and behavioral warnings. High achievers were favored in the public interactions. The nature of these interactions was mainly teacher initiated questioning.

Table 32

Students in class 4 were grouped according to ability. Two of the three groups were visible in that group one, the high ability group, sat on the teacher's left as she faced the class, in the first three rows from the window side of the room. Group two and three sat in the next four rows or to the teacher's right as she faced the class. The teacher's desk was at the side of the room just beyond the seventh row from the windows. Four of the six members of group three, the lowest ability students, sat in the seventh row near the teacher's desk.

Virtually all of the language arts was taught using two groups. Group one used level five of the Language Experience Reading Program, and group 2 and 3 (identified by the teacher as group 2) used level four of the same program.

In Table 32 the high achievers on the MAT were those who ranked first to seventh—all were in group one. The low achievers were those who ranked twentieth to twenty-eighth—the six from group 3 were among the low achievers, the other three were from group 2.

TABLE 31

TEACHER 4 - B AND E PROCESS VARIABLES AND FREQUENCY OF INTERACTION FOR HIGH AND LOW ACHIEVERS ON THE MAT TOTAL READING SUBTEST

| Process Variables | Frequence of Interaction | | | |
|---|---|---|---|---|
| | Totals | Totals N = 28 | $\bar{x}$ for Hi Ach | $\bar{x}$ for Lo Ach |
| 1. Private Interactions | 308.03 | 11.00 | 7.14 | 15.26 |
| 2. Teacher Initiated | 176.54 | 6.31 | 4.29 | 8.22 |
| 3. Work (Brief + Obs) | 14.00 | .50 | .57 | .90 |
| 4. Work, Long | 9.24 | .33 | .14 | .55 |
| *5. Procedure | 72.04 | 2.57 | 2.29 | 3.08 |
| *6. Behavior, Warn | 68.30 | 2.44 | 1.57 | 4.57 |
| 7. Student Initiated | 131.49 | 4.70 | 2.14 | 5.04 |
| *8. Work, Brief | 56.28 | 2.01 | .71 | 2.10 |
| *9. Work, Long | 35.56 | 1.27 | .43 | 1.34 |
| 10. Public Interactions | 641.81 | 22.92 | 16.57 | 18.68 |
| 11. Teacher Initiated | 552.51 | 19.73 | 16.14 | 15.76 |
| 12. Self Ref Ques | 1.00 | .04 | .14 | 0.0 |
| 13. Process To (Pre + N Vol) + Ans | 7.00 | .25 | .14 | .22 |
| *14. Process To (Vol + Call) + Ans | 64.40 | 2.30 | 2.14 | 1.12 |
| 15. (Product + Choice) To (Pre + N Vol) + Ans | 12.27 | .47 | 0.0 | .92 |
| *16. (Product + Choice) To (Vol + Call) + Ans | 278.68 | 9.95 | 8.14 | 7.33 |
| Teacher Feedback | | | | |
| *17. + Ans, Affirmed | 384.23 | 11.94 | 9.57 | 8.36 |
| 18. + Ans, No Response | 15.10 | .54 | .71 | .23 |
| 19. Failure to Ans +, Term | 128.80 | 4.60 | 3.33 | 3.58 |
| 20. Failure to Ans +, Sus | 5.99 | .214 | 0.0 | .11 |
| 21. Student Initiated | 89.31 | 3.19 | 2.43 | 3.02 |
| 22. Comment | 65.11 | 2.33 | 2.00 | 2.22 |
| 23. Comm + Ques Accepted | 53.76 | 1.92 | 1.29 | 1.29 |

*Indicates the main interaction sequences.

TABLE 32

STUDENTS OF TEACHER 4, RANK ORDERED BY FREQUENCY AND PROPORTION OF INTERACTION, ACHIEVEMENT SCORES, ATTITUDE SCORES AND FREQUENCY OF DISCIPLINE PROBLEMS AND ABSENTEEISM

| | Frequency of Interactions | | | | | | | Interaction Proportions | | | | | Achievement | Attitudes | Self-concept | Behaviors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Private | | | Public | | | Total Public&Private | | | Private | | | | | | |
| Rank Order | Total Priv & Pub Interactions | Total | Teacher Initiated | Student Initiated | Total | Teacher Initiated | Student Initiated | Acad / Total | Acad with Praise / Total Work | Acad with Crit / Total Work | Work Long / Total Work | Work Brief / Total Work | MAT Total Reading | CAI Total Score | SEI Sch-Ach Subscale | No of Disc | Absenteeism |
| Totals | 949.82 | 308.03 | 176.54 | 131.49 | 641.81 | 553.51 | 88.31 | | | | | | | | | | |
| High Score | 68.00 | 28.00 | 24.00 | 10.00 | 52.00 | 45.00 | 9.00 | .93 | .14 | .18 | 1.00 | 1.00 | 94 | 79 | 16 | 10 | 23.0 |
| 1 | 11 | 14 | 6 | 11 | 11 | 11 | 9 | 15 | 8 | 14 | 3 | 22 | 25 | 23 | 3 | 4 | 10 |
| 2 | 20 | 4 | 14 | 17 | 20 | 20 | 14 | 18 | 5 | 10 | 12 | 27 | 18 | 15 | 5 | 3 | 13 |
| 3 | 19 | 24 | 12 | 24 | 19 | 19 | 11 | 1 | 19 | 27 | 9 | 25 | 27 | 25 | 25 | 24 | 6 |
| 4 | 18 | 2 | 24 | 26 | 18 | 15 | 16 | 3 | 13 | 13 | 4 | 8 | 9 | 3 | 23 | 2 | 26 |
| 5 | 9 | 26 | 2 | 23 | 15 | 18 | 20 | 26 | 4 | 12 | 21 | 5 | 3 | 16 | 15 | 9 | 23 |
| 6 | 14 | 12 | 27 | 18 | 9 | 21 | 12 | 25 | 24 | 28 | 16 | 28 | 22 | 22 | 8 | 14 | 28 |
| 7 | 12 | 23 | 20 | 16 | 21 | 9 | 4 | 11 | 18 | * | 1 | 6 | 8 | 5 | 22 | 27 | 24 |
| 8 | 4 | 11 | 23 | 28 | 12 | 1 | 18 | 13 | 3 | | 17 | 23 | 15 | 8 | 11 | 12 | 2 |
| 9 | 15 | 17 | 26 | 14 | 1 | 12 | 28 | 19 | 25 | | 16 | 19 | 6 | 21 | 26 | 17 | 14 |
| 10 | 26 | 20 | 22 | 2 | 28 | 26 | 27 | 26 | 28 | | 7 | 13 | 16 | 7 | 7 | * | 8 |
| 11 | 1 | 27 | 19 | 9 | 25 | 25 | 6 | 21 | 12 | | 19 | 14 | 17 | 6 | 13 | | 1 |
| 12 | 23 | 28 | 11 | 12 | 26 | 23 | 13 | 6 | 9 | | 24 | 26 | 11 | 19 | 28 | | 17 |
| 13 | 21 | 19 | 17 | 6 | 23 | 22 | 3 | 5 | 15 | | 2 | 20 | 20 | 20 | 6 | | 19 |
| 14 | 28 | 9 | 10 | 21 | 2 | 28 | 25 | 9 | 20 | | 14 | 10 | 4 | 13 | 16 | | 5 |
| 15 | 24 | 10 | 9 | 20 | 6 | 2 | 19 | 22 | 11 | | 11 | 11 | 7 | 1 | 17 | | 21 |
| 16 | 1 | 18 | 28 | 10 | 22 | 6 | 10 | 23 | 14* | | 26 | 24 | 19 | 11 | 18 | | 16 |
| 17 | 6 | 6 | 6 | 13 | 13 | 13 | 5 | 10 | 17 | | 23 | 7 | 5 | 18 | 20 | | 22 |
| 18 | 27 | 22 | 8 | 19 | 14 | 27 | 24 | 8 | 16 | | 20 | 16 | 2 | 27 | 21 | * | * |
| 19 | 17 | 16 | 13 | 1 | 27 | 17 | 17 | 16 | 3 | | 10 | 15 | 21 | 10 | 3 | | 12 |
| 20 | 25 | 13 | 1 | 25 | 4 | 5 | 21 | 20 | 22 | | 28 | 2 | 26 | 17 | 12 | | 4 |
| 21 | 22 | 21 | 15 | 7 | 18 | 10 | 22 | 7 | 7 | | 8* | 17 | 14 | 26 | 19 | | 3 |
| 22 | 13 | 25 | 25 | 4 | 5 | 24 | 1 | 17 | 1 | | 25 | 18 | 1 | 9 | 10 | * | 25 |
| 23 | 10 | 1 | 5 | 15 | 24 | 6 | 15 | 12 | 27 | | 27 | 9 | 13 | 28 | 4 | | 18 |
| 24 | 16 | 8 | 7 | 3 | 10 | 14 | 21 | 2 | 10 | | 22 | 1 | 12 | 4 | 27 | | 20 |
| 25 | 5 | 15 | 3 | 5 | 17 | 16 | 7* | 24 | 21 | | 5 | 4* | 28 | 14 | 1 | | 27 |
| 26 | 8 | 7 | 21 | 27 | 1 | 1 | 1 | 27 | 26 | | 19 | 21 | 23 | 1 | 24 | | 9 |
| 27 | 7 | 5 | 18 | 22 | 2 | 2 | 8 | 4 | 6 | | 13 | 12 | 24 | 24 | 9 | | 11 |
| 28 | 3 | 3 | 16* | 8 | 8 | 8 | 26 | 14 | 23 | | 6 | 3 | 10 | 12 | 14* | | 15* |
| Low Score | 8.00 | 2.00 | 0.0 | 1.00 | 5.00 | 5.00 | 0.0 | .27 | 0.0 | 0.0 | 0.0 | 0.0 | 58 | 28 | 0 | 0 | 0 |
| $\bar{X}$ Score | 33.92 | 11.00 | 6.31 | 4.70 | 22.92 | 19.73 | 3.19 | .76 | .03 | .02 | .34 | .96 | 72.75 | 48.86 | 9.64 | .82 | 7.34 |

*Indicates when score of zero (0) begins.

Tables 33 and 34

1. Private Interactions

There is a significant negative correlation between teacher initiated private interactions and reading achievement. More specifically, low achievers had many more procedural comments. In mathematics, high achievement and procedural comments are positively related, whereas long work contacts and a high percentage of teacher initiated work contacts are negatively related to mathematics achievement. Student initiated long work interactions are positively related to mathematics achievement.

Several things were happening in the mathematics classes that explain these confusing correlations.

1. Teacher initiated private interactions in language arts classes were often with the "low" group (see Table 32).

2. This same type of interaction in mathematics classes sometimes involved marking activity sheets from the students' activity file, work that was unrelated to the mathematics lesson.

3. Students who initiated interactions usually had their mathematics textbooks and exercise books in hand and so were seeking and receiving help on the specific lesson for that day.

The many relatively high correlations between private interactions and the product measures are summarized as follows:

1. Total private interactions and teacher initiated interactions are significantly negatively related to both pupil attitudes and self-concept and positively related to discipline visits to the office, and style B (peer oriented, non-conforming) and C (withdrawn)

TABLE 33

TEACHER 4 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

| | Process Variables | MAT Total Reading | MAT Total Math | CAI Total Score | SEI Sch-Ach Subscale | Discipline Visits to Office | Absenteeism |
|---|---|---|---|---|---|---|---|
| 1. | Private Interactions | -.343* | .383** | -.663*** | -.530*** | .572*** | .103 |
| 2. | Teacher Initiated | -.251 | .363* | -.589*** | -.564*** | .717*** | -.007 |
| 3. | Work (Brief + Obs) | -.227 | -.110 | .179 | .197 | -.166 | .514*** |
| 4. | Work, Long | -.066 | -.410** | .068 | .020 | .299 | -.166 |
| †5. | Procedure | -.333* | .411** | -.502*** | -.422** | .477** | .144 |
| †6. | Behavior, Warm | -.149 | .267 | -.595*** | -.597*** | .697*** | -.172 |
| 7. | Work/Total | .144 | -.430** | .464** | .393** | -.140 | -.036 |
| 8. | Proc/Total | .032 | .192 | .157 | .332* | -.209 | .089 |
| 9. | Beh/Total | .132 | -.177 | -.104 | -.034 | .167 | -.225 |
| 10. | Student Initiated | -.290 | .240 | -.353* | .094 | -.118 | .254 |
| †11. | Work, Brief | -.277 | .291 | -.118 | .245 | -.289 | .401** |
| †12. | Work, Long | -.110 | .349* | -.455** | .170 | .088 | -.043 |
| 13. | Work/Total | -.118 | .167 | .068 | .038 | .035 | .168 |
| 14. | Work Long/T & S Work | .011 | .208 | -.199 | -.172 | .365* | -.384** |
| 15. | Work Brief/T & S Work | .125 | .275 | .288 | .190 | -.449** | .259 |
| 16. | Public Interactions | .049 | .646*** | .056 | -.106 | -.189 | -.338* |
| 17. | Teacher Initiated | .030 | .665*** | .030 | .003 | -.258 | -.310 |
| 18. | Self Ref Ques | .362* | -- | .247 | .261 | -.082 | -.164 |
| 19. | Process To (Pre + N Vol) + Ans | .042 | -- | -.259 | -.202 | -.100 | -.122 |
| †20. | Process To (Vol + Call) + Ans | .367* | .456** | .117 | .151 | .052 | -.490*** |
| 21. | (Product + Choice) To (Pre + N Vol) + Ans | -.044 | .438** | -.197 | .083 | .085 | -.094 |
| †22. | (Product + Choice) To (Vol + Call) + Ans | .008 | .557*** | .125 | .052 | -.332* | -.251 |
| | Teacher Feedback | | | | | | |
| †23. | Correct (+) Ans, Affirmed | .086 | .551*** | .139 | .095 | -.281 | -.348* |
| 24. | + Ans, No Response | .224 | .241 | -.165 | -.140 | .098 | -.153 |
| 25. | Failure to Ans +, Terminated | -.097 | .449*** | -.064 | -.091 | -.242 | -.080 |
| 26. | Failure to Ans +, Sustained | .073 | .325* | .127 | .262 | -.132 | -.230 |
| 27. | Student Initiated | .102 | -.042 | -.393** | -.511*** | .224 | -.245 |
| 28. | Totals Private and Public | -.119 | .566*** | -.358* | -.338* | .109 | -.236 |
| 29. | Acad with Praise /Total Work Contacts | .085 | .094 | -.081 | .010 | .109 | -.065 |
| 30. | Acad with Criticism /Total Work Contacts | -.351* | -- | -.330* | -.035 | .032 | .316 |

† Indicates main interaction sequences.

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 34

TEACHER 4 - CORRELATIONS BETWEEN B AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CASES DATA

| | Process Variables | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1. | Private Interactions | .180 | .607*** | .473** | .226 | -.079 | .161 | -.451** | -.508*** | .227 | .243 | .184 | .004 | .431** | -.315 | -.285 | .356* |
| 2. | Teacher Initiated | .130 | .724*** | .497** | .273 | -.295 | .173 | -.304 | -.408** | .225 | .288 | .170 | -.020 | .254 | -.273 | -.176 | .186 |
| 3. | Work (Brief + Obs) | .349* | -.079 | .364 | .432 | -.240 | .009 | -.120 | -.117 | -.189 | .019 | -.208 | -.018 | .100 | -.174 | .069 | .045 |
| 4. | Work, Long | -.256 | .205 | -.167 | -.278 | .120 | -.134 | -.153 | .078 | .075 | -.146 | -.013 | -.127 | .189 | -.063 | .079 | -.036 |
| 5. | Procedure | .050 | .483*** | .498*** | .378** | -.408** | .275 | -.218 | -.226 | .208 | .394** | .147 | .045 | .053 | -.243 | -.085 | -.052 |
| 6. | Behavior, Warn | .147 | .721*** | .429** | .183 | -.168 | .109 | -.260 | -.477*** | .226 | .178 | .169 | -.065 | .328* | -.185 | -.231 | .344* |
| 7. | Work/Total | -.151 | -.280 | -.176 | -.164 | .207 | -.190 | -.007 | .138 | -.153 | -.031 | -.235 | -.153 | -.083 | .431** | -.013 | .190 |
| 8. | Proc/Total | -.167 | -.274 | -.065 | .152 | -.037 | .144 | .174 | .079 | -.075 | .201 | -.189 | -.223 | -.092 | .264 | .132 | -.136 |
| 9. | Beh/Total | .113 | .130 | -.030 | -.079 | .251 | -.147 | -.411** | -.185 | .112 | .023 | .218 | .116 | .128 | -.079 | -.260 | .320* |
| 10. | Student Initiated | .158 | -.051 | .098 | -.026 | .412** | .001 | -.434** | -.358* | .074 | -.016 | .084 | .049 | .490*** | -.183 | -.307 | .453** |
| 11. | Work, Brief | .286 | -.202 | -.022 | -.044 | .237 | .117 | -.322* | -.051 | -.112 | .009 | -.089 | .012 | .353* | -.218 | -.086 | .149 |
| 12. | Work, Long | .098 | .119 | .000 | -.071 | .369* | -.254 | -.176 | -.405** | .174 | -.100 | .123 | -.032 | .343* | -.077 | -.187 | .358 |
| 13. | Work/Total | -.179 | -.150 | -.101 | -.063 | -.204 | .051 | .250 | .357* | .011 | .227 | -.069 | .025 | .030 | .055 | .021 | -.207 |
| 14. | Work, Long/T & S Work | -.196 | .254 | -.063 | -.255 | .212 | -.279 | .003 | -.167 | .210 | -.143 | .199 | .014 | .148 | .285 | -.197 | .186 |
| 15. | Work, Brief/T & S Work | .221 | -.342* | .055 | .228 | -.179 | .147 | .160 | .158 | -.300 | -.045 | -.248 | -.074 | -.178 | -.212 | .313 | -.293 |
| 16. | Public Interactions | .116 | -.162 | -.070 | -.028 | .269 | .031 | -.380** | -.068 | .034 | -.215 | .188 | .089 | .195 | -.341* | -.075 | .145 |
| 17. | Teacher Initiated | .114 | -.221 | -.112 | -.020 | .223 | -.036 | -.340* | .025 | .014 | -.244 | .133 | .080 | .160 | -.364* | -.025 | .114 |
| 18. | Self Ref Quest | -.094 | -.194 | .006 | -.201 | .148 | -.085 | .019 | .094 | -.053 | -.069 | -.094 | -.154 | -.091 | .203 | .156 | -.154 |
| 19. | Process To (Pre + N Vol) + Ans | -.045 | -.048 | .115 | .254 | .072 | -.077 | -.023 | -.273 | .161 | -.017 | .267 | .104 | .259 | -.029 | -.172 | .025 |
| 20. | Process To (Vol + Call) + Ans | -.129 | -.166 | -.151 | -.153 | .211 | -.419** | -.062 | .072 | -.048 | -.242 | .165 | .154 | -.046 | -.263 | .065 | -.138 |
| 21. | (Product + Choice) To (Pre + N Vol) + Ans | .016 | .178 | .065 | .224 | -.121 | -.027 | .048 | -.169 | .245 | .406** | .189 | .085 | .181 | -.046 | -.246 | .084 |
| 22. | (Product + Choice) To (Vol + Call) + Ans | .219 | -.291 | -.141 | -.032 | .203 | .002 | -.304 | .088 | -.096 | -.299 | .017 | .019 | .100 | -.321* | .052 | .111 |
| | Teacher Feedback | | | | | | | | | | | | | | | | |
| 23. | Correct (+) Ans, Affirmed | .146 | -.303 | -.121 | -.025 | .214 | -.101 | -.287 | .075 | -.081 | -.325* | .064 | .060 | .094 | -.324* | .047 | .065 |
| 24. | + Ans, No Response | .181 | .016 | -.385** | -.216 | .353* | -.141 | -.034 | -.053 | -.035 | -.064 | .223 | .138 | -.150 | -.329* | .020 | -.052 |
| 25. | Failure to Ans +, Terminated | .176 | -.091 | -.124 | .007 | .213 | .083 | -.392** | -.054 | .097 | -.066 | .161 | .107 | .172 | -.417** | -.130 | .243 |
| 26. | Failure to Ans +, Sustained | -.162 | -.075 | -.046 | .021 | .047 | -.036 | -.142 | .054 | .161 | -.134 | .143 | .035 | .197 | -.190 | .011 | -.097 |
| 27. | Student Initiated | .052 | .194 | .156 | -.042 | .299 | .296 | -.314 | -.425** | .094 | .044 | .306 | .072 | .225 | -.032 | -.242 | .198 |
| | Totals Private and Public | | | | | | | | | | | | | | | | |
| 28. | Acad with Praise / Total Work Contacts | -.100 | -.057 | .103 | .188 | -.078 | .007 | .206 | -.105 | .107 | .357* | .117 | .161 | -.192 | -.145 | .022 | -.313 |
| 29. | Acad with Criticism / Total Work Contacts | -.029 | .170 | .504*** | .341* | -.332* | .680*** | -.120 | -.141 | .020 | -.014 | -.070 | -.085 | .204 | .115 | -.169 | .355* |

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

behavior in teacher directed settings.

The nature of these interactions was mainly procedural and behavioral warnings and it is these main interaction sequences that involved the low achievers, those with negative attitudes and self-concept, those who are most frequently disciplined and those who exhibit style B and C behaviors in teacher directed settings.

2. High percentages of interactions that are teacher initiated work related are positively related to both attitudes and self-concept.

3. Student initiated private interactions that were work related long, are negatively related to attitudes.

4. It is not merely the number of interactions that are significantly related to these outcome measures but the nature of the interaction is differentially related to attitudes and self-concept.

2. Public Interactions

The variables related to the main interaction sequences in the public arena are positively related to mathematics achievement but not so with reading achievement. The sequences may be described as focusing on recitation of information and drill and therefore they may be more appropriate for mathematics lessons at this grade level. But they do not appear to be as appropriate for language arts. The exceptions in language arts are the one sequence including the more open ended process questions, and self reference questions. The importance and appropriateness of self reference questions and process questions has been discussed. Self reference questions are clearly not a part of the recitation of information or drill type lessons. None of the main public interactions are significantly related to

attitudes or self-concept. There are negative correlations with absenteeism indicating simply that those who are absent frequently, interact with the teacher less frequently.

Two interesting correlations with interaction and the behavior of children in non-teacher directed settings are between teacher initiated procedural comments and style B (peer oriented, non-conforming) and between product and choice (low level questions) asked of preselects or non-volunteers and style B behaviors. It would appear that the teacher used questions and procedural comments to control the behavior of the children who were inappropriately self directed, talkative, delaying or non-conforming (style B). Student initiated private interactions as expected correlated significantly with style E (adult dependent) and style H (other-directed, task oriented).

3. Praise and Criticism

A high proportion of criticism within work contacts is negatively related with reading achievement and attitudes. Criticism is also significantly positively related to style C (passive, withdrawn) and style F (social, productive). Very little style F behaviors in teacher directed settings were allowed in this classroom. But when it did occur it occurred in students who also exhibited much more style C behaviors. So these correlations are caused by one group of students who had a high proportion of criticism within their interactions. They were criticized when they were social, assertive and integrative and may as a result have become passive, withdrawn, fearful, and avoidant (style C). Hence the positive correlation between

proportion of criticism and style C and style F behaviors.

No significant relationships were found between proportion of praise within work contacts and achievement, attitudes, or self-concept.

## Teacher 5 and Class 5 - Grade 6

The results for teacher and class 5 are reported in Figures 30 to 32 and Tables 35 to 38.

### Figures 30 to 32

a. Private Interactions (.58 in language arts)

Teacher 5 used a greater variety of process behaviors than the first four teachers. Private interactions were in the majority but not as much so as in the lower grades. Within the private domain no one particular sequence dominates. Of interest is the high proportion of work interactions initiated by the teacher that received praise.

b. Public Interactions (.42 in language arts)

Teacher 5's main questioning sequence was to ask a question of a volunteer, the difficulty level being such that the probability of getting a correct answer was high, followed by an affirmation. The variation with teacher 5 was that the questions used were both process and product questions.

Another unique feature within teacher 5's main public interaction sequence (number 2) was to often give no feedback at all to correct answers.

A high proportion of public interactions were student initiated. Anecdotal notes reveal that the teacher was not satisfied with these student initiated interactions. The class was described by the teacher as a difficult class to manage.

> . . . the most difficult group to handle that I've ever had. They've been hard on me emotionally because they are so bright and they get so excited and they sort of

FIGURE 30

TEACHER NO. 5 IN LANGUAGE ARTS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—307 of 737

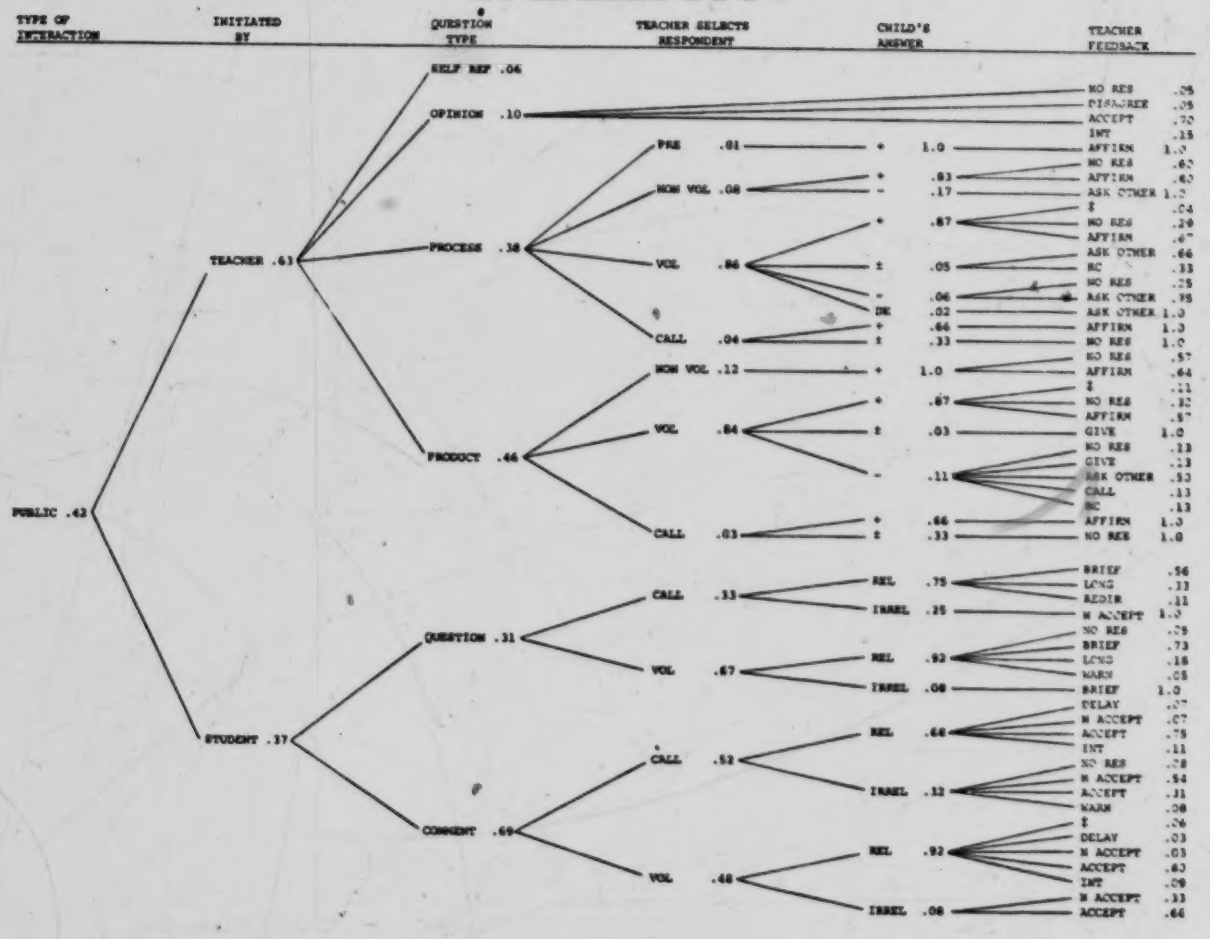


FIGURE 31

TEACHER NO. 5 IN LANGUAGE ARTS
NATURE OF PRIVATE INTERACTIONS—PROPORTION
NO. OF PRIVATE INTERACTIONS—430 OF 737

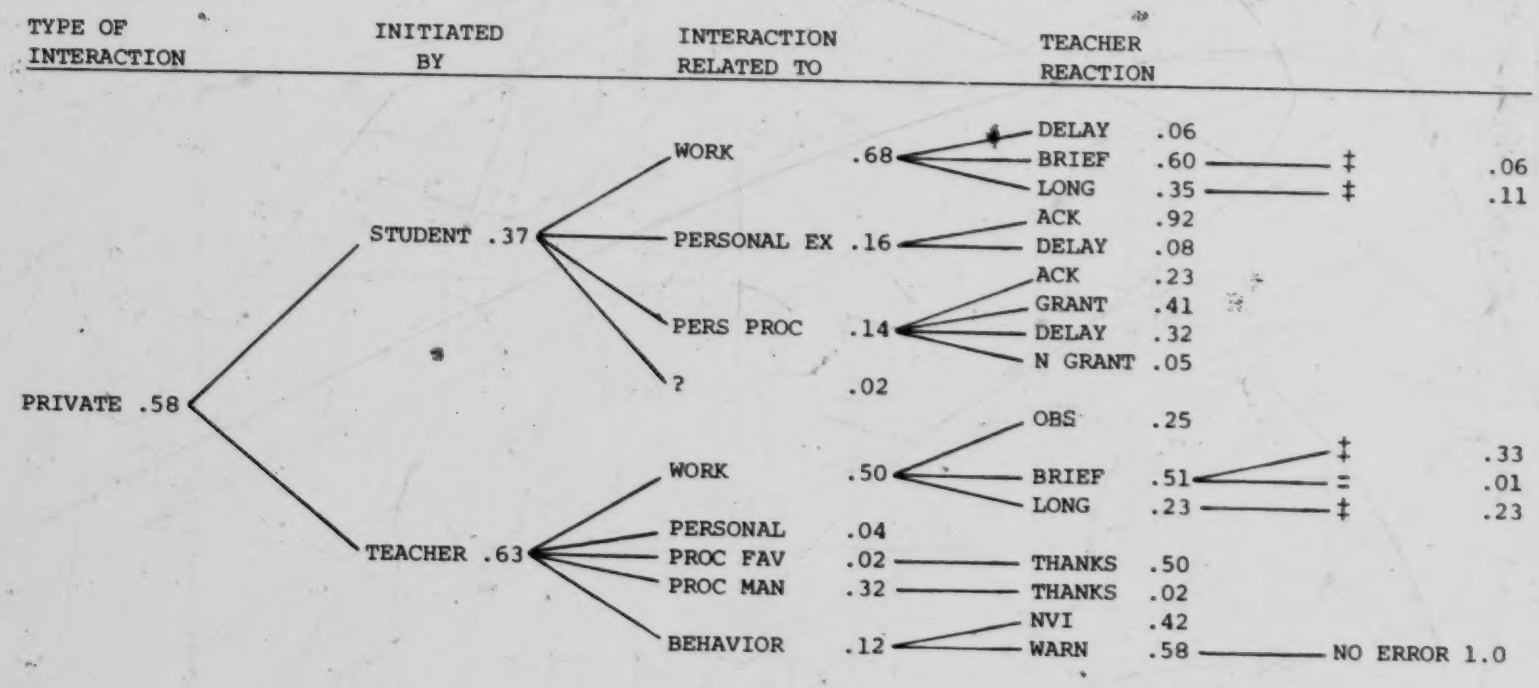
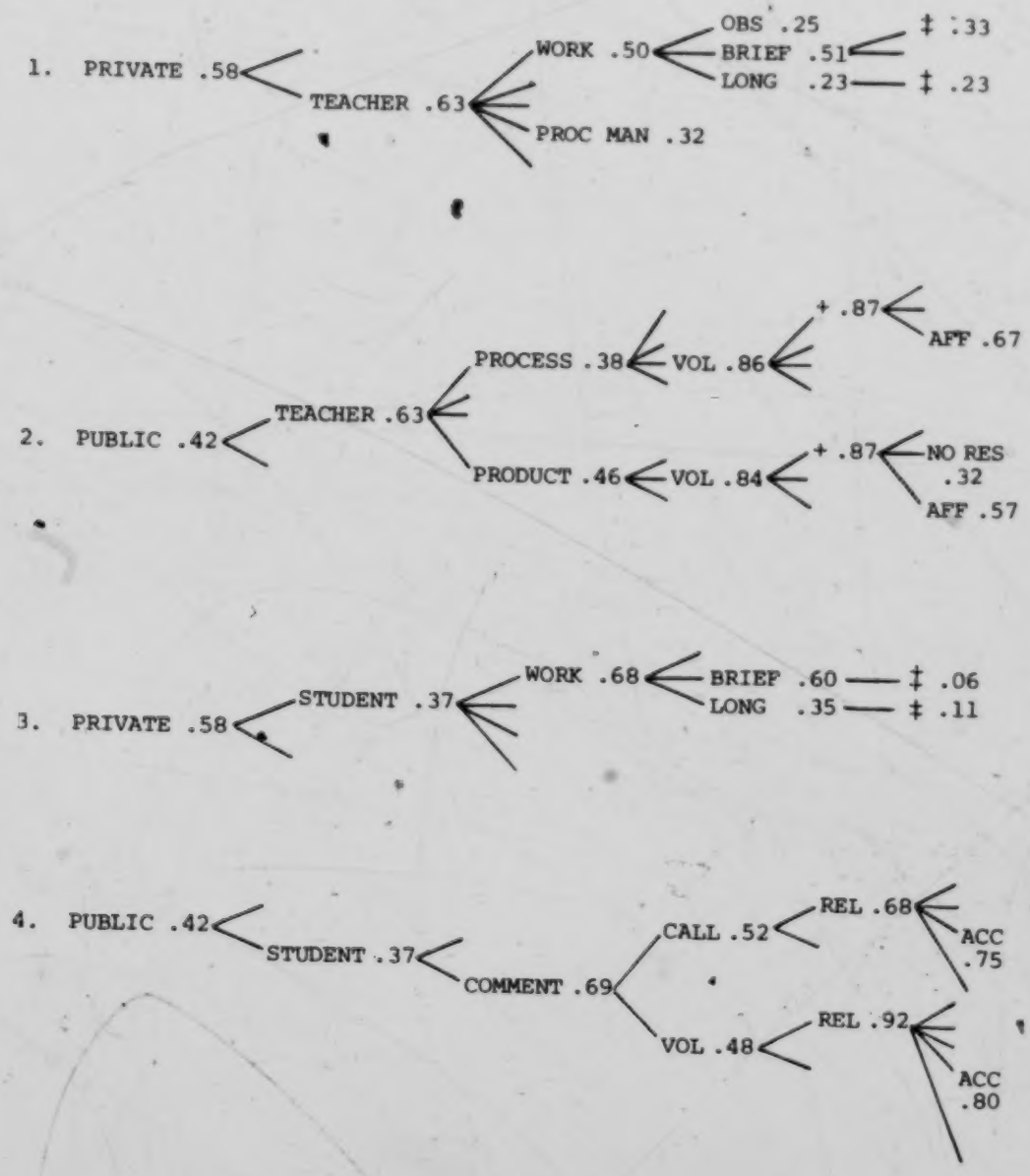


FIGURE 32

TEACHER NO. 5—PROPORTION OF MAIN INTERACTION SEQUENCES IN LANGUAGE ARTS



> get carried away with things . . . Discussions don't work with this class worth a hoot.

It is clear that the student initiated comments were not welcomed. Most were comments and most were called out. Sixty-eight percent of the called out comments were relevent to the lesson. Ninety-eight percent of the comments initiated by volunteers were relevant to the lesson. Fifty-four percent of the irrelevant call out comments were not accepted by the teacher.

Table 35

Table 35 reveals that both private and public interactions favored the high achievers. On every variable high achievers received more interaction that low achievers. The composition of the class may explain why this differential treatment of students within the class.

The class was described by the teacher as a very bright class but with a wide range of ability. Within the range there was a distinct split between high and low ability students. Twenty students were identified as the top students, and five were assessed as "having problems with reading and that sort of thing." Also reported by the teachers was the statement, "I spend more time than I should with the top students, there are more of them." The teacher also reported—"You notice that I give pretty well all my help to these students—these five." Help was perceived by the teacher in terms of having to tell them what to do and how to do it. Coders in this classroom noted that extended blocks of time spent with the five during the study were not frequent.

TABLE 35

TEACHER 5 - B AND E PROCESS VARIABLES AND FREQUENCY OF INTERACTION FOR HIGH AND LOW ACHIEVERS ON THE MAT TOTAL READING SUBTEST

| Process Variables | Frequence of Interaction | | | |
|---|---|---|---|---|
| | Totals | Totals N = 25 | $\bar{x}$ for Hi Ach | $\bar{x}$ for Lo Ach |
| 1. Private Interactions | 422.59 | 17.70 | 28.28 | 12.27 |
| 2. Teacher Initiated | 279.56 | 11.18 | 16.74 | 9.74 |
| *3. Work (Brief + Obs) | 107.00 | 4.28 | 5.85 | 4.90 |
| *4. Work, Long | 31.75 | 1.27 | 1.20 | 1.00 |
| *5. Procedure | 95.42 | 3.82 | 6.53 | 3.27 |
| 6. Behavior, Warn | 19.65 | .79 | 1.80 | 0.0 |
| 7. Student Initiated | 163.02 | 6.52 | 11.53 | 2.53 |
| *8. Work, Brief | 66.75 | 2.67 | 4.64 | .50 |
| *9. Work, Long | 38.50 | 1.54 | 2.80 | 1.37 |
| 10. Public Interactions | 310.02 | 12.40 | 20.86 | 6.67 |
| 11. Teacher Initiated | 195.84 | 7.83 | 10.33 | 4.77 |
| 12. Self Ref Ques | 11.22 | .45 | .80 | 0.0 |
| 13. Process To (Pre + N Vol) + Ans | 6.20 | .25 | .40 | 0.0 |
| *14. Process To (Vol + Call) + Ans | 57.87 | 2.32 | 3.20 | 2.17 |
| 15. (Product + Choice) To (Pre + N Vol) + Ans | 11.22 | .45 | 1.44 | 0.0 |
| *16. (Product + Choice) To (Vol + Call) + Ans | 69.12 | 2.77 | 2.84 | 1.40 |
| Teacher Feedback | | | | |
| *17. + Ans, Affirmed | 88.93 | 3.56 | 5.64 | 2.00 |
| *18. + Ans, No Response | 45.27 | 1.81 | 1.67 | 1.24 |
| 19. Failure to Ans +, Term | 18.20 | .728 | .60 | .53 |
| 20. Failure to Ans +, Sus | 2.00 | .08 | .20 | 0.0 |
| 21. Student Initiated | 114.18 | 4.57 | 10.53 | 1.90 |
| *22. Comment | 79.32 | 3.17 | 7.44 | .87 |
| *23. Comm + Ques Accepted | 93.00 | 3.72 | 8.53 | 1.57 |

*Indicates the main interaction sequences.

Table 36

The five students discussed above (21, 10, 20, 23 and 3) do in fact score the lowest on the MAT total reading. Tracing the five students in Table 36 they consistently rank low in terms of frequency of interaction but their rankings are spread throughout the interaction proportions. Students 20 and 21 received no praise within any of their interactions. All five rank middle to high in proportions of interactions that are academic in nature. Notice too that the five score low on self-concept (SEI), all had a number of discipline visits to the office and all of them score low on the CAI (Attitudes).

Of the remaining 20 in the class, student numbers 4, 17 and 12 consistently rank high in the frequency of interaction columns. They also rank in the top five of the MAT total reading. So, not only did the low achievers interact less frequently with the teacher, the highest of the high achievers interacted more frequently with the teacher than the remaining students in the class.

Tables 37 and 38

1. Private Interactions

Variables significantly related to reading achievement may be interpreted as follows. The type of interaction the teacher had with the high achievers was either behavior warnings or student initiated interactions that were work related—given brief attention. Interactions with low achievers were most often work related. There are no significant relationships either positive or negative between private interactions and attitudes, self-concept and discipline visits.

Table 38 contains many correlations between private interactions

TABLE 36

STUDENTS OF TEACHER S, RANK ORDERED BY FREQUENCY AND PROPORTION OF INTERACTION, ACHIEVEMENT SCORES, ATTITUDE SCORES AND FREQUENCY OF DISCIPLINE PROBLEMS AND ABSENTEEISM

| | Frequency of Interactions | | | | | | | Interaction Proportions | | | | | Achievement | Attitudes | Self-concept | Behaviors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Private | | | Public | | | Total Public & Private | | | Private | | | | | | |
| Rank Order | Total Priv & Pub Interactions | Total | Teacher Initiated | Student Initiated | Total | Teacher Initiated | Student Initiated | Acad / Total | Acad with Praise / Total Work | Acad with Crit / Total Work | Work Long / Total Work | Work Brief / Total Work | MAT Total Reading | CAI Total Score | SEI Sch-Ach Subscale | No of Disc | Absenteeism |
| Totals | 752.59 | 422.59 | 279.56 | 163.02 | 310.02 | 195.84 | 114.18 | | | | | | | | | | |
| High Score | 62.00 | 39.00 | 27.00 | 24.00 | 31.00 | 20.00 | 16.00 | .87 | .25 | .06 | .67 | 1.00 | 120 | 72 | 14 | 13 | 19.5 |
| 1 | 4 | 15 | 4 | 15 | 17 | 19 | 12 | 6 | 14 | 25 | 8 | 16 | 4 | 2 | 19 | 10 | 11 |
| 2 | 17 | 4 | 17 | 7 | 12 | 4 | 17 | 19 | 6 | * | 20 | 1 | 16 | 24 | 2 | 22 | 13 |
| 3 | 12 | 17 | 14 | 12 | 4 | 17 | 1 | 10 | 4 | | 18 | 17 | 15 | 14 | 9 | 18 | 6 |
| 4 | 15 | 1 | 1 | 1 | 19 | 9 | 4 | 23 | 17 | | 7 | 22 | 17 | 19 | 14 | 25 | 15 |
| 5 | 1 | 12 | 15 | 9 | 1 | 2 | 7 | 21 | 20 | | 13 | 21 | 12 | 18 | 11 | 15 | 16 |
| 6 | 9 | 7 | 18 | 17 | 9 | 12 | 2 | 11 | 18 | | 15 | 10 | 19 | 11 | 24 | 4 | 12 |
| 7 | 19 | 9 | 12 | 4 | 2 | 18 | 15 | 25 | 2 | | 12 | 11 | 8 | 16 | 18 | 9 | 21 |
| 8 | 7 | 22 | 22 | 22 | 7 | 20 | 22 | 14 | 24 | | 19 | 3 | 6 | 1 | 8 | 21 | 4 |
| 9 | 2 | 14 | 21 | 11 | 18 | 7 | 9 | 13 | 22 | | 6 | 9 | 2 | 9 | 13 | 3 | 25 |
| 10 | 22 | 18 | 3 | 2 | 15 | 6 | 23 | 5 | 15 | | 23 | 4 | 1 | 17 | 16 | 20 | 19 |
| 11 | 18 | 2 | 19 | 23 | 22 | 1 | 16 | 20 | 7 | | 24 | .14 | 22 | 13 | 5 | 1 | 16 |
| 12 | 14 | 23 | 23 | 25 | 20 | 3 | 21 | 16 | 12 | | 5 | 25 | 25 | 8 | 23 | 23 | 14 |
| 13 | 20 | 19 | 25 | 19 | 6 | 13 | 19 | 8 | 10 | | 3 | 5 | 14 | 3 | 22 | * | 7 |
| 14 | 23 | 25 | 2 | 20 | 3 | 15 | 24 | 4 | 3 | | 4 | 3 | 18 | 15 | 3 | | 22 |
| 15 | 25 | 13 | 9 | 18 | 16 | 5 | 18 | 3 | 11 | | 25 | 24 | 9 | 7 | 1 | | 12 |
| 16 | 16 | 16 | 16 | 16 | 5 | 25 | 5 | 2 | 9 | | 14 | 12 | 5 | 5 | 4 | | 3 |
| 17 | 13 | 20 | 5 | 14 | 24 | 10 | 11 | 22 | 19 | | 9 | 15 | 11 | 23 | 15 | | 24 |
| 18 | 3 | 21 | 24 | 6 | 11 | 22 | 20 | 12 | 21* | | 2 | 13 | 7 | 10 | 25 | | 1 |
| 19 | 5 | 5 | 7 | 10 | 13 | 8 | 3 | 15 | 5 | | 11 | 23 | 13 | 12 | 7 | | 17 |
| 20 | 11 | 1 | 10 | 5 | 23 | 14 | 6 | 9 | 1 | | 10 | 19 | 24 | 6 | 21 | | 20 |
| 21 | 21 | 10 | 20 | 8 | 25 | 11 | 25 | 7 | 13 | | 21 | 7 | 3 | 22 | 20 | | 3 |
| 22 | 10 | 11 | 8 | 24 | 10 | 16 | 10* | 24 | 16 | | 22 | 18 | 23 | 25 | 12 | | 5 |
| 23 | 24 | 24 | 13 | 21 | 8 | 24 | 8 | 18 | 23 | | 16* | 20 | 20 | 4 | 17 | | 8 |
| 24 | 6 | 8 | 11 | 3* | 14 | 23 | 14 | 17 | 8 | | 1 | 6 | 10 | 20 | 10 | | 9* |
| 25 | 8 | 6 | 6 | 13 | 21 | 21 | 13 | 1 | 25 | | 17 | 8 | 21 | 21(Abs) | 6 | | 23 |
| Low Score | 12.16 | 6.00 | 3.00 | 0.0 | 4.00 | 1.00 | 0.0 | .50 | 0.0 | 0.0 | 0.0 | .33 | 72 | 38 | 4 | 0 | 0 |
| X Score | 30.10 | 17.70 | 11.18 | 6.52 | 12.40 | 7.83 | 4.57 | .70 | .09 | .002 | .28 | .69 | 92.72 | 50.08 | 8.08 | 1.80 | 7.42 |

*Indicates when score of zero (0) begins.

TABLE 37

TEACHER 5 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

| Process Variables | MAT Total Reading | CAI Total Score | SEI Sch-Ach Subscale | Discipline Visits to Office | Absenteeism |
|---|---|---|---|---|---|
| 1. Private Interactions | .410** | .006 | -.111 | .030 | .017 |
| 2. Teacher Initiated | .252 | -.064 | -.055 | .083 | -.137 |
| †3. Work (Brief + Obs) | -.170 | -.320 | -.006 | .185 | .008 |
| †4. Work, Long | .101 | -.005 | .196 | .085 | .268 |
| †5. Procedure | .318 | .035 | -.109 | .023 | -.310 |
| 6. Behavior, Warn | .359* | .072 | -.098 | -.013 | -.115 |
| 7. Work/Total | -.353* | -.233 | .168 | .140 | .527*** |
| 8. Proc/Total | .135 | .091 | .031 | -.027 | -.622*** |
| 9. Beh/Total | .280 | .135 | -.158 | -.076 | .002 |
| 10. Student Initiated | .404** | .071 | -.122 | -.032 | .159 |
| †11. Work, Brief | .447** | .093 | .016 | .128 | .084 |
| †12. Work, Long | .178 | -.040 | -.251 | -.096 | .058 |
| 13. Work/Total | .217 | .265 | -.063 | -.008 | -.319 |
| 14. Work Long/T & S Work | .064 | .018 | -.026 | -.166 | .011 |
| 15. Work Brief/T & S Work | -.100 | -.019 | .063 | .193 | -.049 |
| 16. Public Interactions | .469** | .165 | -.027 | -.193 | -.209 |
| 17. Teacher Initiated | .446** | .277 | .176 | -.166 | -.139 |
| 18. Self Ref Ques | .351* | .161 | .210 | -.004 | -.247 |
| 19. Process To (Pre + N Vol) + Ans | .228 | .162 | .352* | -.124 | .068 |
| †20. Process To (Vol + Call) + Ans | .215 | -.137 | -.435** | .089 | -.093 |
| 21. (Product + Choice) To (Pre + N Vol) + Ans | .309 | .023 | -.147 | -.250 | -.046 |
| †22. (Product + Choice) To (Vol + Call) + Ans | .336 | .427** | .513*** | -.238 | -.100 |
| Teacher Feedback | | | | | |
| †23. Correct (+) Ans, Affirmed | .433** | .165 | .124 | -.031 | -.142 |
| †24. + Ans, No Response | .234 | .286 | .214 | -.279 | .010 |
| 25. Failure to Ans +, Terminated | .204 | .294 | .163 | -.014 | -.154 |
| 26. Failure to Ans +, Sustained | .184 | .085 | .083 | -.165 | -.049 |
| †27. Student Initiated | .357* | .003 | -.227 | -.164 | -.219 |
| 28. Totals Private and Public | .483** | .094 | -.076 | -.089 | -.105 |
| 29. Acad with Praise /Total Work Contacts | .288 | .189 | .217 | .008 | .146 |
| 30. Acad with Criticism /Total Work Contacts | .058 | -.151 | -.208 | .266 | .040 |

†Indicates main interaction sequences.

* .10 ≥ p > .05
** .05 ≥ p > .01
*** p ≤ .01

TABLE 36

TEACHER 5 - CORRELATIONS BETWEEN A AND E TEACHER VARIABLES AND PUPIL BEHAVIORAL STYLES AS DETERMINED BY CARES DATA

| Process Variables | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1. Private Interactions | .497** | .405** | .118 | -.241 | -.204 | .058 | .093 | -.068 | .396** | .244 | .087 | -.300 | .370* | .101 | -.099 | -.472** |
| 2. Teacher Initiated | .097 | .423** | -.049 | -.162 | -.198 | .054 | .232 | -.109 | .299 | .146 | .206 | -.233 | .305 | .050 | -.092 | -.436** |
| 3. Work (Brief + Obs) | .231 | -.002 | -.008 | -.187 | -.147 | -.105 | .139 | .174 | -.136 | .016 | .306 | -.032 | .206 | .068 | -.130 | -.117 |
| 4. Work, Long | .006 | .200 | -.249 | -.421** | -.105 | -.048 | .491** | -.073 | -.236 | -.336* | .009 | -.106 | -.142 | .023 | .320 | -.181 |
| 5. Procedure | .110 | .418** | -.044 | -.023 | -.145 | .196 | -.006 | -.128 | .265 | .166 | .039 | -.181 | .306 | -.123 | .140 | -.135 |
| 6. Behavior, Warn | .022 | .435** | -.037 | .009 | -.187 | .058 | .248 | -.180 | .519*** | .181 | .016 | -.332 | .193 | .257 | -.157 | -.378* |
| 7. Work/Total | -.247 | -.449** | .130 | -.188 | .098 | -.232 | .061 | .216 | -.468** | -.312 | .135 | .200 | -.187 | .001 | -.026 | .177* |
| 8. Proc/Total | .090 | .327 | -.135 | .326 | -.145 | .327 | -.221 | -.021 | .130 | .112 | -.147 | -.017 | .089 | -.203 | .226 | -.143 |
| 9. Beh/Total | .365* | .284 | -.165 | -.625 | -.106 | .142 | .093 | -.096 | .572*** | .187 | -.088 | -.349* | .231 | .381* | -.331 | -.317 |
| 10. Student Initiated | .690** | .231 | .271 | -.205 | -.231 | -.060 | -.078 | -.003 | .374* | .243 | -.063 | -.258 | .289 | .111 | -.154 | -.243 |
| 11. Work, Brief | .403** | .298 | .360* | -.191 | -.342* | -.103 | .089 | .133 | .473** | .098 | -.052 | -.382* | .254 | .219 | -.102 | -.167* |
| 12. Work, Long | .740*** | .136 | -.068 | -.150 | .066 | .084 | -.165 | -.099 | .019 | .246 | -.047 | .034 | .255 | -.148 | -.054 | -.031 |
| 13. Work/Total | -.076 | .019 | -.200 | -.063 | .122 | -.172 | .131 | .148 | -.118 | -.138 | .067 | .578*** | .000 | -.143 | -.038 | -.014 |
| 14. Work, Long/T & S Work | .324 | .240 | -.329* | .119 | .248 | .154 | .088 | -.168 | -.302 | -.111 | -.138 | .148 | -.131 | -.230 | .317 | .039 |
| 15. Work, Brief/T & S Work | -.368 | -.173 | .298 | .143 | -.092 | -.106 | -.183 | .207 | .133 | .314 | .062 | -.170 | .075 | .248 | -.327 | -.063 |
| 16. Public Interactions | .312 | .442** | .202 | -.066 | -.026 | -.084 | .093 | -.350* | .193 | .121 | -.023 | -.361 | .324 | -.166 | .202 | -.262 |
| 17. Teacher Initiated | .048 | .327 | .211 | -.135 | -.037 | -.130 | .232 | -.283 | -.064 | -.040 | -.078 | -.202 | .083 | -.241 | .435** | -.230 |
| 18. Self Ref Ques | .144 | .383* | .311 | .069 | -.329 | .010 | .105 | .008 | .581*** | .221 | -.075 | -.304 | .106 | .018 | .151 | -.198 |
| 19. Process To (Pro + N Vol) + Ans | -.124 | .183 | -.165 | -.114 | -.032 | -.191 | .634*** | -.275 | -.107 | -.167 | -.098 | -.285 | -.161 | -.011 | .409** | -.273 |
| 20. Process To (Vol + Call) + Ans | .252 | .413** | -.041 | -.155 | .075 | .228 | -.198 | -.298 | -.005 | .040 | .095 | .135 | .231 | -.278 | -.042 | .217 |
| 21. (Product + Choice) To (Pro + N Vol) + Ans | .510*** | .304 | -.180 | .120 | .078 | -.275 | .047 | -.315 | -.193 | .048 | -.142 | -.378* | .312 | -.019 | .012 | -.090 |
| 22. (Product + Choice) To (Vol + Call) + Ans | -.351 | .057 | .425** | -.097 | -.132 | -.290 | .248 | -.005 | -.178 | -.109 | -.193 | -.223 | -.184 | -.131 | .555*** | -.333 |
| Teacher Feedback | | | | | | | | | | | | | | | | |
| 23. Chere : (+) Ans, Affirmed | .087 | .478** | .156 | -.186 | -.199 | -.112 | .062 | -.129 | -.055 | .039 | .031 | -.177 | .209 | -.328 | .329 | -.268 |
| 24. + Ans, No Response | -.044 | .053 | -.056 | .123 | .142 | -.278 | .347* | -.343* | -.220 | .138 | -.272 | -.242 | -.262 | -.048 | .395* | -.085 |
| 25. Failure to Ans +, Terminated | -.158 | .196 | .332 | .100 | -.111 | .033 | .058 | -.107 | .239 | .418** | .066 | -.123 | -.193 | -.208 | .249 | -.162 |
| 26. Failure to Ans +, Sustained | .467** | .193 | -.213 | .045 | .123 | -.164 | .224 | -.341* | -.081 | -.029 | -.140 | -.232 | .258 | -.174 | .179 | -.021 |
| 27. Student Initiated | .490** | .432** | .134 | .023 | -.006 | .025 | -.076 | -.317 | .389** | .250 | .040 | -.245 | .477** | -.041 | -.098 | -.252 |
| Totals Private and Public | | | | | | | | | | | | | | | | |
| 28. Aced with Praise / Total Work Contacts | -.009 | -.029 | -.036 | -.618** | .270 | -.031 | .111 | -.258 | -.196 | -.034 | -.181 | -.046 | .130 | -.049 | .011 | .069 |
| 29. Aced with Criticism / Total Work Contacts | -.074 | .110 | .385* | -.073 | -.288 | -.113 | .288 | .120 | -.063 | -.138 | .768*** | .145 | .298 | -.111 | -.055 | -.078 |

* .10 > p > .05
** .05 > p > .01
*** p < .01

and style A (aggressive, manipulative) and B (peer oriented, non-conforming) behaviors in both teacher directed and non-teacher directed settings. The teacher attended frequently, with procedural comments, with behavioral warnings, and with brief and long interactions, to students who initiated interaction and to students who exhibited style A and B behaviors.

2. Public Interactions

Variables significantly related to reading achievement are the total number of interactions, teacher initiated interactions, affirming correct answers, and once again self reference questions. One of the teacher's main sequences (asking low level questions of volunteers and calls and receiving and affirming correct answers) is positively related to pupil attitudes and pupil self-concept. The same sequence using process questions is negatively related to self-concept. But when the teacher preselects the student or asks non-volunteers a significant positive relationship emerges. In Table 38 we see that public interaction variables are also significantly positively related to style A (aggressive, manipulative) and B (peer oriented, non-conforming) behaviors in teacher directed and non-teacher directed settings. The correlations between preselecting children and asking non-volunteers to answer questions and style A behaviors indicates that the questions are likely being used for behavior control rather than for instructional purposes. Similarly, sustaining responses appear to have been used for the same purpose.

Process questions of preselects and non-volunteers are significantly positively related to style G (independent, productive

and self-directed) behaviors in both teacher directed and non-teacher directed settings.

3. Praise and Criticism

No significant relationships were found between praise and criticism and any of the product measures in Table 37. However, praise correlates significantly negatively with style D (peer dependent, distractable) behaviors in teacher directed settings, whereas criticism correlates positively with style C behaviors (passive, withdrawn, fearful and avoident) in both teacher directed and non-teacher directed settings. Students who are distractable in teacher directed settings were not praised often and students who exhibit passive, withdrawn, fearful and avoident were often criticized. It is not clear whether the students became passive and withdrawn as a result of criticism of they were criticized for being withdrawn.

## Teacher 6 and Class 6 - Grade 6

The results for teacher and class 6 are reported in Figures 33 to 35 and in Tables 39 to 42.

### Figures 33 to 35

1. Public Interactions (.64 in language arts)

Teacher 6 used a greater variety of behaviors in interaction sequences than the other five teachers in the study. As with teacher 2, teacher 6's preselecting students to answer questions was a preferred mode and surprisingly, often gave no response to correct answers. In teacher 6's second main public interaction sequence (number 3) other unique patterns within this study are evident. The level of difficulty of the process questions are such that partly correct and partly incorrect (±) answers are given more often than correct answers. Further, teacher feedback is more varied, not only to the partly correct and partly incorrect answers, but also to student initiated comments within public interaction. Sustaining responses appear for the first time as a preferred mode of providing feedback.

Two important points made in the teacher interview that are relevant to the teacher's main interaction sequences are as follows: (1) When the teacher was asked "What kinds of things do you consider to be most important for these children to get out of school?" the teacher said "I'd like them to . . . be able to develop a thinking process, to be able to think on their own and to be able to think through a solution. I'm not interested in every bit of knowledge they acquire." (2) The teacher reported that the discussion method with

FIGURE 11

TEACHER NO. 6 IN LANGUAGE ARTS
NATURE OF PUBLIC INTERACTIONS—PROPORTIONS
NO. OF PUBLIC INTERACTIONS—408 OF 634

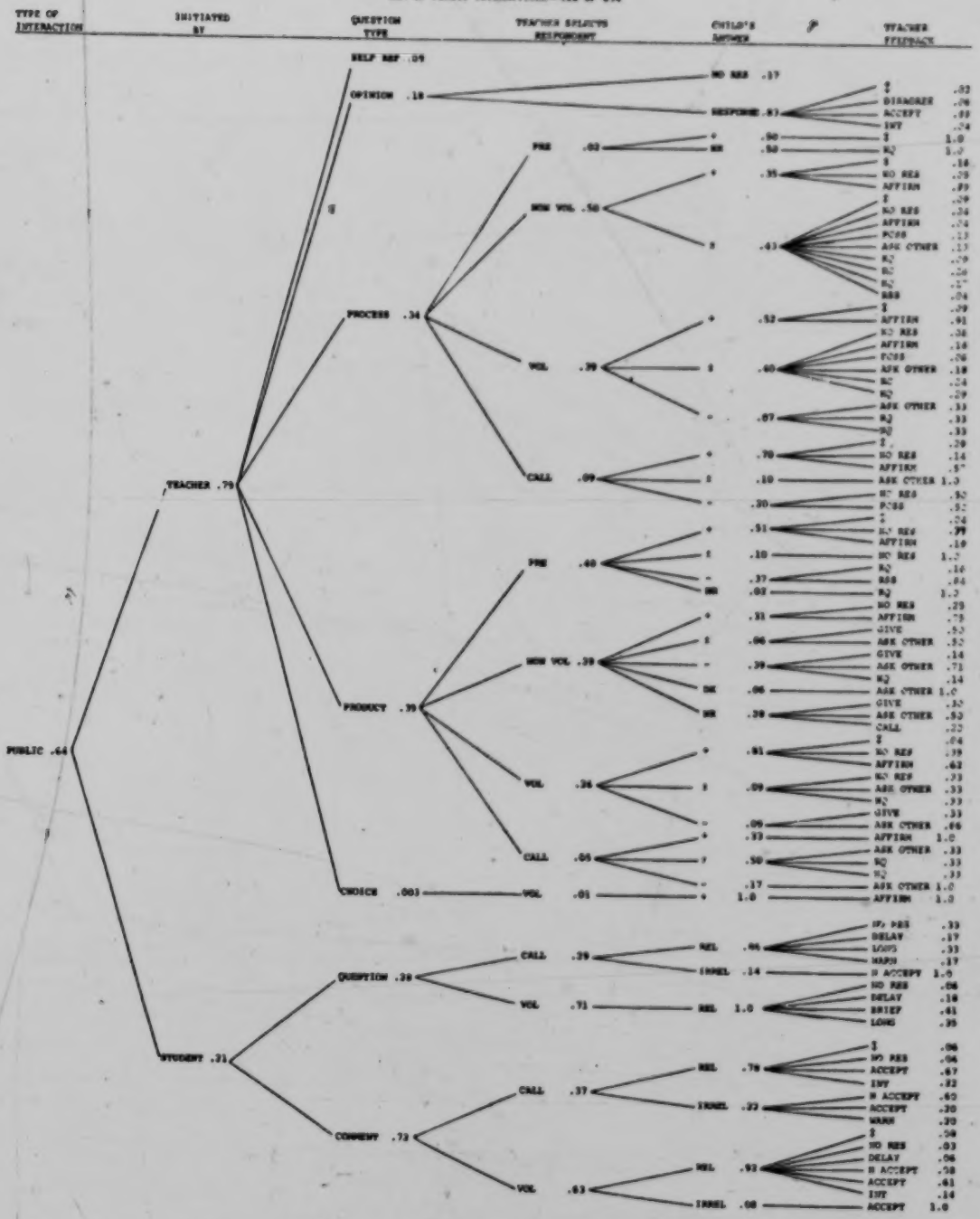


FIGURE 34

TEACHER NO. 6 IN LANGUAGE ARTS
NATURE OF PRIVATE INTERACTIONS—PROPORTION
NO. OF PRIVATE INTERACTIONS—226 OF 634

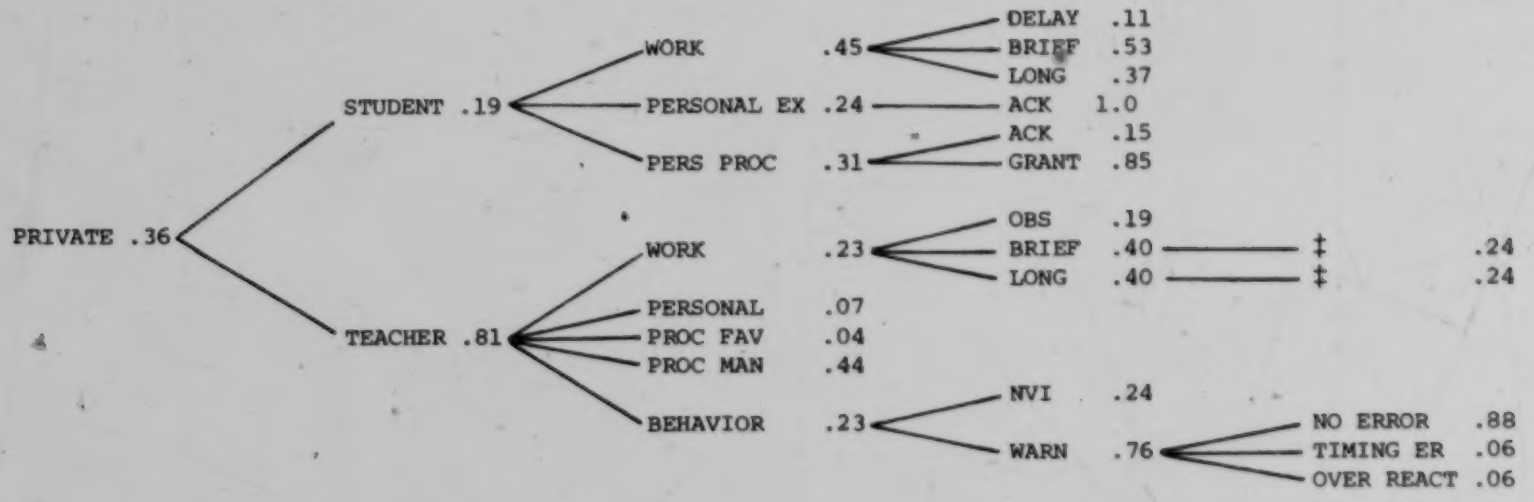
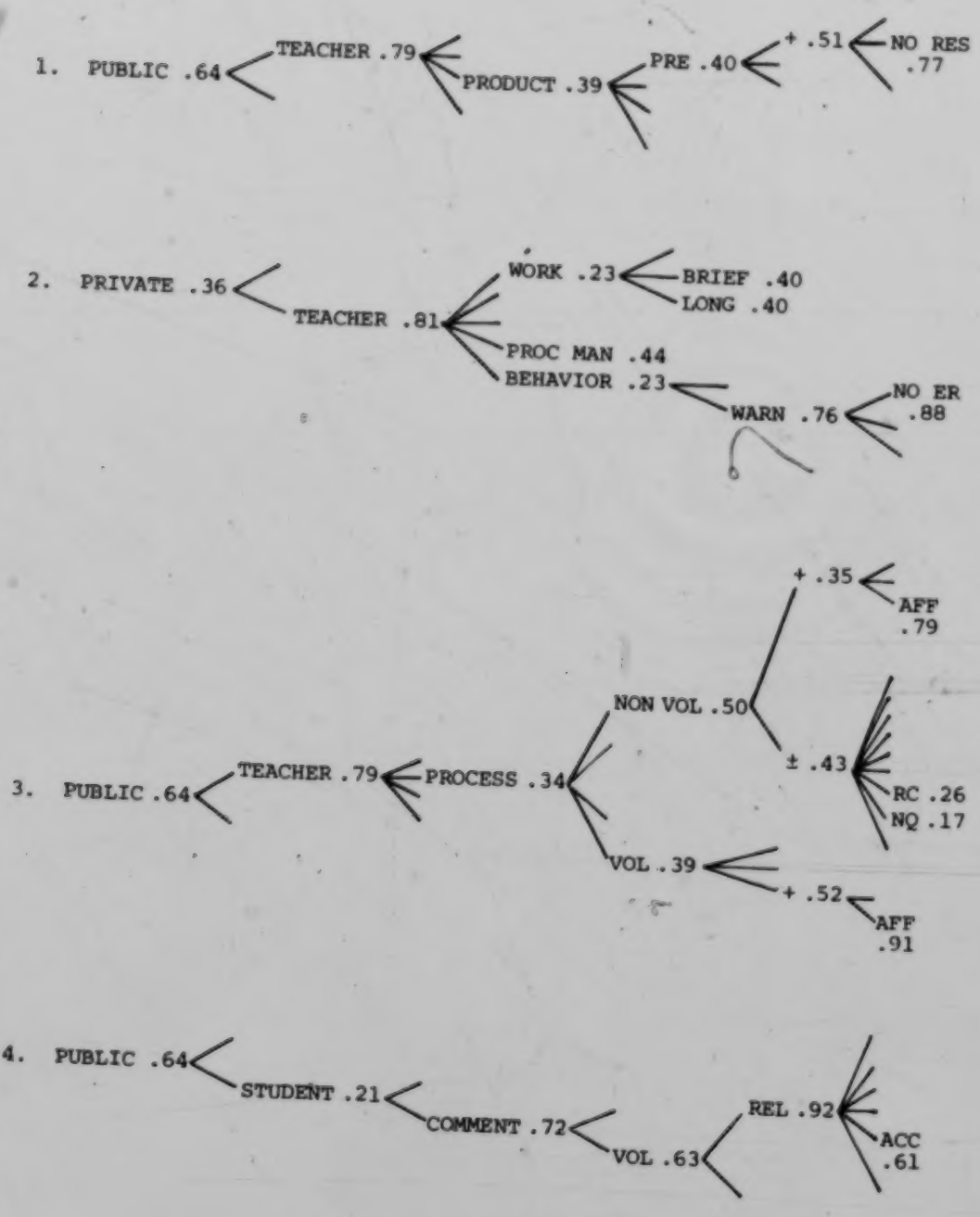


FIGURE 35

TEACHER NO. 6—PROPORTION OF MAIN INTERACTION SEQUENCES IN LANGUAGE ARTS



some sort of written follow up activity, was the main method of instruction used in the class.

The interaction sequences used by the teacher reflect the discussion method used and are consistent with the goal of teaching for thinking. Questions used were not simply low level product or choice questions seeking information or testing for the acquisition of facts related to the content of instruction. The process questions used coupled with the use of sustaining responses required that students engage in more complex thinking operations than simple recall of information. They often required the student to look for relationships, sort the particulars, group facts in new ways, make inferences based on observations, and state conclusions. The assumption the teacher makes who engages students in such a discussion is that learning to think does not necessarily need to be postponed to sometime after the student has "mastered" the facts, but that learning involves a gradual assimilation of facts and ideas to form concepts.

b. Private Interactions (.36 in language arts)

A high proportion of the private interactions was initiated by the teacher and focused mainly on procedural comments. When procedure and behavior management interactions initiated by the teacher are taken together we see that 67 percent of the teacher initiated private interactions were concerned with behavioral manipulation and control by the teacher. It may be that students were uninterested in their work as a number of them did exhibit visible style B (peer oriented, non-conforming), style C (withdrawn) and style D (peer dependent) behaviors in non-teacher directed settings

or styles B and C in teacher directed settings. The procedural and behavioral interactions therefore become necessary to engage disengaged students with the task at hand.

Table 39

Low achievers interacted more frequently in the private domain than high achievers in all but one of the variables. Most of these interactions were procedural and behavioral interactions. It is with these kinds of interactions that low achievers were favored over high achievers.

Total public interactions favored high achievers. The reason is that high achievers initiated more public interactions that the low achievers did. The teacher directed more low level questions to low achievers, whereas self reference and process questions were directed more frequently to high achievers.

Feedback to low achievers includes sustaining responses more frequently than to low achievers.

Table 40

Eight students did not initiate any private interaction with the teacher. One student (21) was not asked any questions by the teacher. Six students did not initiate any public interactions with the teacher. Twelve students received no praise within any of their interaction. None of the students were the recipients of criticism. Eleven students did not have any long work interactions within their total private interactions with the teacher. Seven students did not have any work related brief interaction within their private

TABLE 39

TEACHER 6 - B AND E PROCESS VARIABLES AND FREQUENCY OF INTERACTION FOR HIGH AND LOW ACHIEVERS ON THE MAT TOTAL READING SUBTEST

| Process Variables | Frequence of Interaction Totals | Totals N = 25 | $\bar{x}$ for Hi Ach | $\bar{x}$ for Lo Ach |
|---|---|---|---|---|
| 1. Private Interactions | 259.86 | 10.39 | 5.23 | 11.24 |
| 2. Teacher Initiated | 212.21 | 8.49 | 3.41 | 8.61 |
| *3. Work (Brief + Obs) | 30.00 | 1.20 | 0.0 | .84 |
| *4. Work, Long | 18.75 | .75 | .33 | 1.12 |
| *5. Procedure | 100.43 | 4.02 | 2.08 | 4.15 |
| *6. Behavior, Warn | 37.51 | 1.50 | 0.0 | 1.68 |
| 7. Student Initiated | 47.67 | 1.91 | 1.82 | 2.53 |
| 8. Work, Brief | 11.75 | .47 | .82 | .47 |
| 9. Work, Long | 8.00 | .32 | .33 | .95 |
| 10. Public Interactions | 467.90 | 18.75 | 22.39 | 19.49 |
| 11. Teacher Initiated | 375.86 | 15.03 | 15.72 | 16.70 |
| 12. Self Ref Ques | 34.44 | 1.38 | 1.66 | 1.14 |
| *13. Process To (Pre + N Vol) + Ans | 22.13 | .89 | 1.00 | .87 |
| *14. Process To (Vol + Call) + Ans | 33.25 | 1.33 | 1.66 | 1.52 |
| *15. (Product + Choice) To (Pre + N Vol) + Ans | 37.55 | 1.50 | 1.33 | 1.89 |
| 16. (Product + Choice) To (Vol + Call) + Ans | 32.10 | 1.28 | 1.66 | 1.00 |
| Teacher Feedback | | | | |
| *17. + Ans, Affirmed | 78.52 | 3.14 | 3.00 | 3.29 |
| *18. + Ans, No Response | 35.35 | 1.41 | 2.00 | 1.29 |
| 19. Failure to Ans +, Term | 69.75 | 2.79 | 3.74 | 3.37 |
| *20. Failure to Ans +, Sus | 71.25 | 2.85 | 1.66 | 3.55 |
| 21. Student Initiated | 92.02 | 3.68 | 6.66 | 2.78 |
| *22. Comment | 67.41 | 2.70 | 5.33 | 2.07 |
| *23. Comm + Ques Accepted | 67.25 | 2.69 | 5.33 | 1.58 |

*Indicates the main interaction sequences.

TABLE 40

STUDENTS OF TEACHER 6, RANK ORDERED BY FREQUENCY AND PROPORTION OF INTERACTION, ACHIEVEMENT SCORES, ATTITUDE SCORES AND FREQUENCY OF DISCIPLINE PROBLEMS AND ABSENTEEISM

| | Frequency of Interactions | | | | | | | Interaction proportions | | | | | Achievement | Attitudes | Self-concept | Behaviors | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Private | | | Public | | | Total Public & Private | | | Private | | | | | | |
| Rank Order | Total Priv & Pub Interactions | Total | Teacher Initiated | Student Initiated | Total | Teacher Initiated | Student Initiated | Acad / Total | Acad with Praise / Total Work | Acad with Crit / Total Work | Work Long / Total Work | Work Brief / Total Work | MAT Total Reading | CAI Total Score | SEI Sch-Ach Subscale | No of Disc | Absenteeism |
| Totals | 727.77 | 259.86 | 212.21 | 47.67 | 467.90 | 375.86 | 92.02 | | | | | | | | | | |
| High Scores | 68.00 | 19.00 | 17.00 | 4.94 | 59.00 | 43.18 | 19.00 | .81 | .18 | 0.0 | 1.00 | 1.00 | 101 | 62 | 14 | 4 | 29.5 |
| 1 | 7 | 8 | 8 | 20 | 7 | 9 | 7 | 7 | 17 | * | 5 | 19 | 9 | 13 | 7 | 1 | 15 |
| 2 | 9 | 10 | 14 | 1 | 9 | 7 | 8 | 4 | 16 | | 23 | 18 | 3 | 15 | 6 | 13 | 12 |
| 3 | 8 | 14 | 17 | 13 | 4 | 4 | 16 | 11 | 19 | | 2 | 1 | 22 | 22 | 17 | 10 | 11 |
| 4 | 16 | 2 | 10 | 23 | 8 | 1 | 15 | 16 | 6 | | 24 | 13 | 8 | 7 | 24 | 20 | 26 |
| 5 | 4 | 13 | 26 | 4 | 16 | 17 | 6 | 20 | 1 | | 7 | 6 | 15 | 9 | 22 | 17 | 13 |
| 6 | 10 | 26 | 6 | 2 | 1 | 16 | 10 | 6 | 7 | | 8 | 9 | 19 | 25 | 20 | 15 | 19 |
| 7 | 15 | 17 | 2 | 18 | 15 | 8 | 26 | 8 | 4 | | 26 | 22 | 14 | 23 | 19 | 23 | 7 |
| 8 | 1 | 21 | 15 | 7 | 24 | 14 | 24 | 1 | 20 | | 17 | 14 | 6 | 3 | 25 | 24 | 21 |
| 9 | 17 | 16 | 11 | 21 | 10 | 23 | 20 | 23 | 11 | | 16 | 11 | 21 | 10 | 8 | 25 | 3 |
| 10 | 2 | 6 | 13 | 22 | 23 | 2 | 23 | 17 | 15 | | 21 | 4 | 20 | 18 | 10 | 2 | 2 |
| 11 | 6 | 15 | 21 | 10 | 17 | 15 | 9 | 15 | 23 | | 15 | 10 | 11 | 16 | 18 | 5 | 23 |
| 12 | 24 | 18 | 9 | 16 | 2 | 10 | 14 | 10 | 10 | | 20 | 20 | 25 | 8 | 3 | 26 | 24 |
| 13 | 23 | 20 | 16 | 8 | 6 | 6 | 4 | 9 | 8 | | 4 | 16 | 24 | 6 | 16 | 16 | 9 |
| 14 | 20 | 11 | 18 | 5 | 20 | 20 | 2 | 19 | 16* | | 11 | 17 | 9 | 24 | 15 | 21 | 14 |
| 15 | 13 | 9 | 5 | 24 | 11 | 11 | 18 | 2 | 26 | | 1* | 21 | 13 | 26 | 26 | 18 | 17 |
| 16 | 14 | 7 | 24 | 19 | 13 | 25 | 21 | 24 | 21 | | 18 | 15 | 17 | 14 | 14 | * | 16 |
| 17 | 26 | 1 | 20 | 26 | 25 | 13 | 11 | 13 | 13 | | 19 | 26 | 10 | 19 | 9 | | 19 |
| 18 | 11 | 23 | 7 | 15* | 26 | 5 | 3 | 22 | 3 | | 9 | 8 | 5 | 4 | 4 | | 6 |
| 19 | 18 | 24 | 1 | 25 | 5 | 19 | 13 | 26 | 2 | | 22 | 24* | 26 | 8 | 23 | | 22 |
| 20 | 5 | 5 | 19 | 14 | 14 | 14 | 19* | 25 | 5 | | 14 | 7 | 23 | 11 | 5 | | 22 |
| 21 | 21 | 4 | 23 | 17 | 19 | 22 | 25 | 14 | 25 | | 6 | 23 | 4 | 21 | 11 | | 5 |
| 22 | 19 | 19 | 3 | 9 | 18 | 26 | 1 | 21 | 9 | | 13 | 5 | 1 | 17 | 21 | | 28 |
| 23 | 25 | 22 | 4 | 6 | 22 | 18 | 22 | 5 | 22 | | 18 | 2 | 16 | 20 | 13 | | 4* |
| 24 | 22 | 3 | 25 | 3 | 3 | 3 | 5 | 18 | 18 | | 25 | 3 | 18 | 2 | 2 | | 28 |
| 25 | 3 | 25 | 22 | 11 | 21 | 21* | 7 | 3 | 14 | | 3 | 25 | 2 | 1 | 1 | | 1 |
| Low Score | 5.00 | 2.47 | 1.23 | 0.0 | 1.23 | 0.0 | 0.0 | .20 | 0.0 | 0.0 | 0.0 | 0.0 | 71 | 29 | 2 | 0 | 0 |
| X Score | 29.11 | 10.39 | 8.49 | 1.91 | 18.75 | 15.03 | 3.68 | .52 | .05 | 0.0 | .53 | .69 | 83.00 | 47.84 | 9.92 | 1.32 | 6.40 |

*Indicates when score of zero (0) begins.

interactions. Both high and low achievers appear to be included in those who had little interaction with the teacher.

Three students in this class have been designated as high achievers, students number 7, 3 and 22. Student number seven had the highest number of interactions with the teacher and eighty-five percent of the interactions with student number seven were in the public domain.

In contrast to student number 7 we find students number 3 and 22 had the least number of total interactions and carried very low profiles in both the public and private domains. The three high achievers also scored relatively high on the CAI attitude test and the SEI school academic subtest.

Low achievers include rank 16 to 25.

Tables 41 and 42

1. Private Interactions

There are 150 entries in Table 41 and twelve correlations significant to the .10 level. Only the three correlations significant to the .01 level will be discussed.

The frequency of behavior warnings is significantly positively related to the number of discipline visits to the office and to the number of days absent from school. The raw data (not shown) reveal that students 15, 10, 26 and 13 were the recipients of most of the teacher's behavior warnings. They too were the students with the highest absentee rate (see Table 40). Students 13, 15 and 26 are also included in the list of students who had visits to the office for disciplinary action.

TABLE 41

TEACHER 6 - CORRELATIONS BETWEEN TEACHER B AND E PROCESS VARIABLES AND STUDENT ACHIEVEMENT, ATTITUDES, AND DISCIPLINE AND ABSENTEE FREQUENCE

| | Process Variables | MAT Total Reading | CAI Total Score | SEI Sch-Ach Subscale | Discipline Visits to Office | Absenteeism |
|---|---|---|---|---|---|---|
| 1. | Private Interactions | -.274 | -.212 | -.102 | .139 | .199 |
| 2. | Teacher Initiated | -.134 | -.125 | .020 | -.004 | .281 |
| †3. | Work (Brief + Obs) | .015 | -.374* | .102 | .089 | .217 |
| †4. | Work, Long | -.078 | -.148 | .128 | .115 | .019 |
| †5. | Procedure | -.145 | -.124 | -.135 | -.279 | -.124 |
| †6. | Behavior, Warn | -.118 | .223 | -.006 | .362* | .521*** |
| 7. | Work/Total | -.113 | -.415** | -.042 | .172 | .044 |
| 8. | Proc/Total | .089 | .104 | -.135 | -.332 | -.347* |
| 9. | Beh/Total | -.058 | .189 | .284 | .471** | .509*** |
| 10. | Student Initiated | -.342* | -.211 | -.308 | .362* | -.232 |
| 11. | Work, Brief | -.016 | .048 | .102 | -.052 | -.317 |
| 12. | Work, Long | .092 | -.195 | .042 | .054 | -.236 |
| 13. | Work/Total | .349* | .181 | .223 | -.286 | .151 |
| 14. | Work Long/T & S Work | .223 | .111 | .053 | -.048 | -.104 |
| 15. | Work Brief/T & S Work | .225 | .194 | -.080 | -.079 | -.081 |
| 16. | Public Interactions | .126 | .180 | .151 | -.096 | -.062 |
| 17. | Teacher Initiated | -.004 | .082 | .032 | -.033 | -.122 |
| 18. | Self Ref Ques | .310 | .358 | .194 | -.327 | -.242 |
| †19. | Process To (Pre + N Vol) + Ans | .164 | -.230 | -.048 | .094 | -.091 |
| †20. | Process To (Vol + Call) + Ans | .021 | .241 | .131 | -.088 | .043 |
| †21. | (Product + Choice) To (Pre + N Vol) + Ans | -.114 | -.038 | -.082 | -.231 | -.060 |
| 22. | (Product + Choice) To (Vol + Call) + Ans | .199 | .103 | -.036 | -.236 | -.275 |
| | Teacher Feedback | | | | | |
| †23. | Correct (+) Ans, Affirmed | .048 | .015 | -.001 | -.139 | -.221 |
| †24. | + Ans, No Response | .105 | .125 | .013 | -.200 | .083 |
| 25. | Failure to Ans +, Terminated | .005 | .168 | -.118 | .197 | .138 |
| †26. | Failure to Ans +, Sustained | -.189 | -.188 | .002 | .105 | -.026 |
| †27. | Student Initiated | .352* | .315 | .341* | -.191 | .095 |
| 28. | Totals Private and Public | .041 | .108 | .111 | -.050 | -.002 |
| 29. | Acad with Praise /Total Work Contacts | -.095 | -.248 | .054 | .098 | -.013 |
| 30. | Acad with Criticism /Total Work Contacts | -- | -- | -- | -- | -- |

† Indicates main interaction sequences.

* .10 > p > .05
** .05 > p > .01
*** p < .01

TABLE 43

TEACHER G - CORRELATIONS BETWEEN G AND 3 TEACHER VARIABLES AND PUPIL ACHIEVEMENT GAINS AS DETERMINED BY CARES DATA

| Process Variables | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1. Private Interactions | .232 | .197 | .151 | -.163 | .164 | .190 | -.030 | -.284 | .080 | -.100 | .247 | .251 | -.045 | -.012 | .136 | .095 |
| 2. Teacher Initiated | .303 | .016 | .119 | -.210 | .221 | .231 | -.044 | -.187 | .081 | -.104 | .238 | .386* | -.024 | -.145 | .162 | -.029 |
| 3. Work (Brief + Med) | .090 | -.269* | -.299 | -.049 | .155 | -.396* | .037 | .242 | -.108 | -.113 | .312 | .421** | .096 | -.075 | .099 | -.001 |
| 4. Work, Long | .188 | -.112 | -.078 | -.209 | .025 | .262 | -.323 | .179 | .093 | -.020 | .325 | -.050 | .031 | -.218 | .104 | -.265 |
| 5. Procedure | .160 | -.070 | .053 | -.314 | .352* | .362* | .006 | -.185 | .151 | -.291 | -.103 | -.126 | .153 | .002 | .249 | -.050 |
| 6. Behavior, Mgmt | .238 | .462** | .235 | .053 | -.122 | -.074 | .001 | -.346* | -.153 | .071 | .318 | .577*** | -.151 | -.195 | -.116 | .210 |
| 7. Work/Total | -.012 | -.383 | -.329 | -.126 | .301 | -.397 | -.062 | .217 | -.114 | .231 | .208 | -.022 | .107 | -.077 | -.006 | -.044 |
| 8. Proc/Total | -.057 | -.110 | .054 | -.685 | -.059 | .140 | -.038 | .183 | .077 | -.266 | -.238 | -.180 | -.001 | .048 | .159 | -.030 |
| 9. Beh/Total | .080 | .465** | .080 | .026 | -.009 | -.083 | .059 | -.412** | -.212 | .060 | .156 | .203 | -.063 | -.135 | -.112 | .186 |
| 10. Student Initiated | -.285 | .354* | .060 | .088 | -.116 | -.126 | .038 | -.228 | .067 | .257 | .001 | -.325 | -.051 | .350* | -.330* | .315 |
| 11. Work, Brief | -.147 | -.176 | .057 | .087 | -.101 | .050 | .066 | .193 | .220 | .062 | -.189 | -.167 | -.191 | .217 | -.029 | .200 |
| 12. Work, Long | -.173 | -.070 | -.120 | -.126 | .001 | .031 | .006 | .132 | -.106 | .201 | -.193 | -.287 | .116 | .076 | .008 | .062 |
| 13. Work/Total | .098 | -.486** | -.283 | -.191 | .219 | .149 | .066 | .322 | -.133 | -.312 | -.010 | .301 | .000 | -.154 | .460** | -.178 |
| 14. Work, Long/T & S Work | -.100 | .159 | -.107 | -.160 | -.199 | .197 | -.169 | .163 | -.010 | -.010 | -.066 | -.306 | -.070 | .018 | .103 | -.227 |
| 15. Work, Brief/T & S Work | -.120 | -.137 | -.160 | -.048 | .072 | -.015 | .177 | .089 | -.072 | -.267 | .026 | .110 | -.111 | .229 | .100 | .022 |
| 16. Public Interactions | -.014 | -.131 | -.003 | -.123 | .347* | .360* | .116 | -.193 | .196 | .458** | -.038 | -.169 | .203 | -.169 | -.170 | .007 |
| 17. Teacher Initiated | -.048 | -.170 | -.130 | -.082 | .337* | .132 | .325 | -.133 | .086 | .402** | .025 | -.152 | .411** | -.167 | -.261 | .109 |
| 18. Self Ref Ques | .086 | -.000 | .010 | .009 | .041 | .200 | .167 | -.022 | -.021 | -.009 | -.370* | -.143 | .405** | -.306 | -.053 | -.098 |
| 19. Process To (Pro + N Val) + Ans | -.209 | -.367* | -.407** | -.114 | .335 | .080 | .146 | .156 | -.164 | .359* | -.073 | -.240 | .191 | -.067 | .088 | -.071 |
| 20. Process To (Val + Call) + Ans | .063 | -.086 | -.031 | -.050 | .264 | .369* | .254 | -.160 | .151 | .563*** | -.183 | -.257 | .189 | -.002 | -.283 | .074 |
| 21. (Product + Choice) To (Pro + N Val) + Ans | .009 | -.126 | -.039 | -.133 | .489** | .160 | .667** | -.328 | .120 | .294 | .070 | -.042 | .186 | .038 | -.119 | .195 |
| 22. (Product + Choice) To (Val + Call) + Ans | -.106 | -.128 | -.360 | -.263 | .523*** | .166 | .667*** | -.363 | -.171 | .106 | -.229 | -.088 | .211 | -.201 | .060 | .133 |
| Teacher Feedback | | | | | | | | | | | | | | | | |
| 23. Correct (R) Ans. Affirmed | .020 | -.202 | -.367* | -.272 | .492** | .206 | .368 | -.136 | -.060 | .316 | -.225 | -.239 | .309* | -.086 | -.069 | .054 |
| 24. + Ans, No Response | -.160 | -.063 | -.040 | .015 | .489** | .063 | .566*** | -.301 | -.020 | .249 | .006 | -.060 | .105 | -.024 | -.557 | .101 |
| 25. Failure to Ans +, Terminated | -.188 | .187 | .186 | .050 | -.015 | .161 | .271 | -.235 | .160 | .601*** | .162 | -.050 | -.058 | -.126 | -.473** | .313 |
| 26. Failure to Ans +, Sustained | -.038 | -.309 | -.150 | -.126 | .264 | -.047 | .073 | .018 | .140 | .170 | .247 | -.105 | .350* | -.018 | -.285 | .012 |
| 27. Student Initiated | .064 | .009 | .135 | -.137 | .316 | .711*** | .186 | -.238 | .348* | .383* | -.157 | -.132 | -.050 | -.268 | .008 | -.216 |
| Totals Private and Public | | | | | | | | | | | | | | | | |
| 28. Read with Praise / Total Work Contacts | -.146 | -.417** | -.086 | .071 | .170 | .126 | .038 | .186 | .630** | .628** | .220 | .009 | -.070 | -.136 | .070 | -.233 |
| 29. Read with Criticism / Total Work Contacts | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

* .10 > p > .05
** .05 > p > .01
*** p < .01

The behavioral styles of these particular students are as follows: student 10 is style B, C, E and H in teacher directed settings and B, C and D in non-teacher directed settings; student 13 is B and C in teacher directed settings, and F and G in non-teacher directed settings; student 26 is C and E in teacher directed settings and D and G in non-teacher directed settings. These students then exhibited frequent attention getting, style B behaviors, and were frequently passive, withdrawn and avoidant, style C, in both teacher directed and non-teacher directed settings. Table 42 reveals that, in fact, behavior warnings, percentage behavior warnings and student initiated interaction in the private domain all relate significantly positively with style B behaviors in teacher directed settings. The behavior warnings also correlate positively with style D behaviors in non-teacher directed settings. The many procedural comments initiated by the teacher in private interactions correlate with style E behaviors (conforming, adult dependent) in teacher directed settings, and with style F behaviors (social, assertive, integrative) in non-teacher directed settings.

As inferred in earlier discussion these procedural and behavioral interactions were used for control purposes and they dominate in terms of the types of interaction used by the teacher in the private domain. Notice that students whose interactions were most often work related rarely exhibited style B (peer oriented, non-conforming) behaviors in teacher directed settings but rather they exhibited style G (inner-directed, task oriented) in non-teacher directed settings.

2. Public Interactions

Variables related the main public interaction sequences used by the teacher correlate significantly positively with style E (adult dependent) behaviors in teacher directed settings. The discussion method used by the teacher appears to have ensured control of the class so that the majority of the class exhibited styles E (compliant, dependable, studious, conforming, adult dependent) and H (task-oriented when supervised) in teacher directed settings. These variables also correlate positively with style G (inner-directed, task oriented) behaviors in non-teacher directed settings. As one might expect there is a high positive correlation between student initiated interaction within the public domain and style F in teacher directed settings.

3. Praise and Criticism

Praise correlates positively with students who exhibit style A and B behaviors in non-teacher directed settings and negatively with style B behaviors in teacher directed settings. Coders reported in anecdotal notes that when the teacher "came down hard on someone with a behavioral warning" the teacher would usually follow the warning with something positive. No criticism was coded in this class.

## High Inference Ratings

In Chapter III questions 5, 6 and 7 were stated as follows:

5. What is the relationship between mean ratings of teacher classroom management skills and pupil product measures?

6. What is the relationship between mean ratings of teacher classroom interpersonal skills and pupil product measures?

7. What is the relationship between mean ratings of teacher classroom instructional skills and pupil product measures?

Results related to questions 5, 6 and 7 are presented in Tables 43 and 44. Table 43 presents a summary of the mean ratings taken on each scale. (See Chapter III, page 40 for a detailed explanation as to how the ratings were taken.) The first four variables are measures of teacher classroom management skills: withitness, overlappingness, smoothness and momentum. Variables 5 and 6, clarity and persuasiveness, are measures of teacher instructional skills. Warmth and empathy, variables 7 and 8, are measures of teacher interpersonal skills.

Table 44 contains Spearman rank correlation coefficients showing the relationships between the high inference ratings and pupil achievement, attitudes, and behaviors. The My Class Inventory (MCI) was used in this part of the analysis as a measure of pupil attitudes.

### Discussion of the Results

#### 1. Classroom Management Skills

The four management variables are all positively (NS) related

TABLE 43

SUMMARY OF HIGH INFERENCE RATINGS FOR SIX TEACHERS

| High Inference Rating Scales | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Withitness | 3.7 | 4.0 | 3.3 | 3.0 | 3.9 | 3.7 |
| 2. Overlappingness | 3.2 | 4.3 | 3.3 | 2.4 | 3.9 | 3.4 |
| 3. Smoothness | 3.7 | 4.4 | 3.3 | 3.1 | 3.9 | 3.5 |
| 4. Momentum | 3.7 | 4.2 | 3.2 | 2.8 | 4.4 | 3.2 |
| 5. Clarity | 3.9 | 4.3 | 3.4 | 2.9 | 3.5 | 3.3 |
| 6. Persuasiveness | 3.7 | 4.3 | 3.1 | 3.1 | 4.4 | 3.7 |
| 7. Warmth | 2.8 | 3.9 | 2.9 | 2.2 | 3.6 | 3.8 |
| 8. Empathy | 1.4 | 2.3 | 2.5 | 1.5 | 1.7 | 2.0 |

TABLE 44

SPEARMAN RANK CORRELATION COEFFICIENTS BETWEEN HIGH INFERENCE RATINGS ON TEACHER PROCESS VARIABLES AND PUPIL ACHIEVEMENT, ATTITUDE AND BEHAVIORS

| Product Measures | 1 Withitness | 2 Overlappingness | 3 Smoothness | 4 Momentum | 5 Clarity | 6 Persuasiveness | 7 Warmth | 8 Empathy |
|---|---|---|---|---|---|---|---|---|
| **Achievement** | | | | | | | | |
| MAT Reading Percentile | .464 | .085 | .600 | .580 | .771 | .441 | -.026 | -.486 |
| **Attitudes (My Class Inventory)** | | | | | | | | |
| Satisfaction | .260 | .371 | .314 | .406 | .543 | .088 | .200 | .600 |
| Friction | -.116 | -.371 | -.086 | -- | -.143 | .088 | -.314 | -.714 |
| Competitiveness | -.899* | -1.000** | -.829* | -.754 | -.600 | -.794 | -.943** | -.543 |
| Difficulty | .231 | -.085 | .257 | .029 | .257 | .177 | .086 | -.543 |
| Cohesiveness | .232 | .029 | .314 | .174 | .429 | .147 | -.086 | -.257 |
| Self-concept | .405 | .257 | .429 | .115 | .600 | .088 | .429 | .143 |
| **Behaviors** | | | | | | | | |
| Disc. visits to office | -.029 | .200 | -.143 | .029 | -.543 | .235 | .143 | .086 |
| Absenteeism | -.522 | -.200 | -.657 | -.667 | -.886* | -.441 | -.029 | .257 |
| **Behavior Styles (CASES Observational Data)** | | | | | | | | |
| **Teacher Directed Settings** | | | | | | | | |
| A | -.319 | -.600 | -.200 | -.348 | .143 | -.441 | -.543 | -.486 |
| B | .261 | .543 | .143 | .058 | .029 | .088 | .714 | .771 |
| C | .058 | .314 | -.086 | -.348 | -.314 | -.088 | .571 | .486 |
| D | -.290 | -.029 | -.314 | -.464 | -.086 | -.588 | .086 | .714 |
| E | .725 | .429 | .771 | .841* | .600 | .883* | .257 | -.486 |
| F | .667 | .429 | .771 | .725 | .943** | .530 | .257 | -.029 |
| G | -.058 | .200 | -.086 | .174 | -.200 | .088 | -.029 | .371 |
| H | -.754 | -.771 | -.657 | -.493 | -.371 | -.677 | -.886* | -.257 |
| **Non-Teacher Directed Settings** | | | | | | | | |
| A | .638 | .486 | .714 | .609 | .943** | .383 | .429 | .257 |
| B | -.464 | -.143 | -.543 | -.348 | -.600 | -.383 | -.086 | .429 |
| C | -.870* | -.771 | -.829* | -.812 | -.486 | -.971** | -.771 | .086 |
| D | -.725 | -.714 | -.657 | -.638 | -.257 | -.853* | -.600 | .029 |
| E | .725 | .486 | .771 | .812 | .600 | .853* | .258 | -.371 |
| F | .638 | .829* | .543 | .348 | .429 | .383 | .943** | .771 |
| G | -.174 | -.371 | -.086 | .058 | -.086 | .059 | -.600 | -.657 |
| H | -.232 | -.371 | -.200 | .058 | -.371 | .147 | -.543 | -.714 |

* $P \leq .05$
** $P \leq .01$

to reading achievement, satisfaction, cohesiveness (MCI subscales) and self-concept. There is a trend in these relationships that indicates that teachers who rate high on withitness, overlappingness and momentum were encouraging:

1. reading achievement
2. happiness and enjoyment of the school and the class (satisfaction subscale)
3. friendship and closeness with others in the class (cohesiveness subscale) and
4. positive school-academic self-concepts (SEI).

Significant negative correlations were found between three classroom management skills and the competitiveness perceived by the students in the class. More specifically, teachers who were able to communicate to pupils their awareness of what was going on in the classroom (withitness); who were able to deal with more than one student concurrently (overlappingness); who were able to maintain the ongoing flow of academic events without giving attention to self-initiated intrusions (smoothness), had students who did not perceive their classmates as highly competitive. Children with teachers high on management skills did not view their classmates as always wanting to be best or finished first.

Negative relationships (NS) between management skills and friction also emerged. This is consistent with the other relationships between management skills and the MCI subscales.

Significant negative correlations between management skills and behavior styles in non-teacher directed settings were found. The

significant negative relationships were between withitness and style C (withdrawn) behaviors, and smoothness and style C (withdrawn) behaviors. Teachers who rated high on withitness and smoothness averted the passive, withdrawn, fearful and avoident behaviors of their students. A significant positive relationship was found between overlappingness and style F (social, productive) behaviors. The teachers able to deal with more than one matter or student at a time were able to allow students to be assertive with one another, to work together cooperatively and productively, and to engage in integrative social behavior.

A significant positive relationship was found between teacher momentum and style E (adult dependent) behaviors in teacher directed settings. Teachers who were able to maintain the pace of the lesson without overdwelling on one point or without fragmentation had students who were attentive, contributing, responding appropriately. The students were on task and conforming to the authority of the teacher.

2. Instructional Skills

Persuasiveness carries with it the concept of the teacher's ability to motivate students to engage in the tasks at hand. Significant negative correlations were found between teacher persuasiveness and style C (withdrawn) and style D (peer oriented) behaviors in non-teacher directed settings. Teachers who rated high on persuasiveness motivated their students sufficiently to result in little student withdrawal or passivity, or peer oriented distractable behaviors. Significant positive relationships were found between persuasiveness

and style E (adult dependent) behaviors in both teacher directed and non-teacher directed settings. As expected, the teachers able to motivate their students had students pay close attention, contribute ideas, respond appropriately, and ask for help when it was appropriate (style E).

Significant positive relationships were found between clarity and style F (social productive) behaviors in teacher directed settings and style A (aggressive manipulative) behaviors in non-teacher directed settings. A significant negative relationship was found between clarity and absenteeism. The two grade one teachers rated highest on clarity; and the grade one students exhibited more style A (aggressive, manipulative) behaviors and style F (social, productive) behaviors than the grade threes and sixes. The grade one classes also had the lowest absentee rate for the six classes.

3. Interpersonal Skills

Teacher warmth correlates significantly negatively with competitiveness (MCI subscale). Teachers who did not reject students and were not mechanical or passive in their interactions with students rated at least a 3 on the scale for the measurement of warmth. Teachers who showed more than interest in their students, who gave explicit evidence of accepting and valuing students rated 4 or 5 on the warmth scale. It was in classes where teachers rated high on warmth that the students perceived little competitiveness. From the student's point of view the emphasis was not on who can be best or first.

Warmth also correlated significantly negatively with style H

(other-directed, task oriented) in teacher directed settings. Perhaps the acceptance, valuing and prizing allows the students to be less concerned with conforming to authority, and more concerned with social productive behaviors (style F). In fact, warmth correlates significantly positively with style F (social productive) behaviors in non-teacher directed settings. It may be that the "accepting," "allowing," and "prizing" were misinterpreted by some students as licence for style A (aggressive, manipulative) and style B (peer oriented, non-conforming) behaviors. Warmth correlates possitively (NS) with both style A and B behaviors.

No significant relationships were found between empathy and any of the product measures. The ratings on empathy for all teachers were low (see Table 43). The scale (see Appendix B) was applied rigorously. The teacher's understanding of what the student meant or was feeling had to be verbalized in the language of the student in order for a 3, 4 or 5 rating to be given. High level empathic responses as defined by the scales used in this study were rarely heard.

In summary, teacher classroom management skills are positively related to a sense of well being by the students, social integrative behaviors, and adult-dependent task oriented behaviors. Teacher persuasiveness is positively related to more desirable task oriented behaviors and negatively related to less desirable behaviors. Where teacher warmth was in evidence students reported that they did not feel there was an over emphasis on being best or first. The behaviors of children where warmth was evident were more social and productive.

Chapter V

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## Summary

The main purpose of this study was to investigate the relationships between teacher behaviors and pupil behaviors, achievement and attitudes.

Six teachers volunteered to participate in a large scale study of teaching and learning of which this study is one part. The sample of teachers included one grade one teacher, one grade three teacher, and one grade six teacher, in each of two schools. Teacher process data were collected using the Expanded Brophy-Good Dyadic Interaction Observation System. Eight high inference rating scales were also used to obtain measures of classroom management, instructional, and interpersonal skills. Observations extended over a three week period with 10 hours observations in grades one and three language arts and mathematics classes and 7 1/2 hours of observation in grade six language arts classes.

Metropolitan Achievement Tests (MAT Reading and Mathematics) were administered to the students in the six classes. Measures of pupil attitudes to school, class, teacher, peers and self were taken as follows:

Grade Ones - The Oral School Attitude Test (SAT),

Grade Threes and Sixes - The Children's Attitude Inventory (CAI),

All Grades - The Coopersmith Self Concept Test (SEI),

All Grades - The My Class Inventory (MCI).

The number of times a student was sent to the office for disciplinary reasons and student absenteeism were recorded as circumstantial evidence of pupil attitudes to school. Finally, pupil behavioral styles calculated from intensive observations of pupils' coping behaviors in both teacher directed and non-teacher directed settings were used as product measures. R. Spaulding's CASES observational system was used to collect behavioral data on each student in each class.

Teacher process data derived from the low inference observational system were categorized and proportions of each behavior type calculated. Sequences of teacher behaviors were described in detail and process variables for use in correlational analysis were determined on the basis of what teachers did most often.

Important findings presented and discussed in Chapter IV are summarized as follows:

1. Proportions of private interactions were high. They ranged from .23 to .85 in language arts and from .51 to .94 in mathematics. It is reasonable to assume therefore that little time was spent in direct teaching compared to private individualized instruction during seatwork. Table 45 (variables 1-15) reveals that private interaction variables were generally not positively related to achievement, and were negatively related to pupil attitudes.

Trends in the data suggest that private interactions may be a function of student ability, self concept and behaviors. For example: (1) frequency of private interactions generally favored

TABLE 45

SUMMARY OF RESULTS OF CORRELATIONS BETWEEN TEACHER BEHAVIORS AND PUPIL ACHIEVEMENT, ATTITUDES, SELF CONCEPT AND BEHAVIORS

| B & E Process Variables (Teachers) | Reading Achievement 1 2 3 4 5 6 | Attitudes 1 2 3 4 5 6 | Self-concept 1 2 3 4 5 6 | Productive Behaviors* T.D. Setting 1 2 3 4 5 6 | N-T.D. Setting 1 2 3 4 5 6 |
|---|---|---|---|---|---|
| 1. Private Interactions | - + | - - | + - - | - | - |
| 2. Teacher Initiated | | - - | - | + | |
| 3. Work (Brief + Obs) | | | + | | |
| 4. Work, Long | | | | - - + | |
| 5. Procedure | - | - - | | | |
| 6. Behavior, Warn | + | - - - | - | + - + | |
| 7. Work/Total | - | + + | + | | |
| 8. Proc/Total | + | | + | | |
| 9. Beh/Total | | - | | - | |
| 10. Student Initiated | + | - | + | + | |
| 11. Work, Brief | + | + | + + | - - | - |
| 12. Work, Long | | - | | + | + |
| 13. Work/Total | | | + | + + + | + |
| 14. Work, Long/T & S Work | + | | - | + | - |
| 15. Work, Brief/T & S Work | - | | + | - | + |
| 16. Public Interactions | + + | - - | + | + + - + | |
| 17. Teacher Initiated | + + + | - | + - | - + | + |
| 18. Self Pef Ques | + + + | | | | - |
| 19. Process To (Pre + M Vol) + Ans | | | + | + | + |
| 20. Process To (Vol + Call) + Ans | + + + | | - | + - | |
| 21. (Product + Choice) To (Pre + M Vol) + Ans | + | - | | + | |
| 22. (Product + Choice) To (Vol + Call) + Ans | + | - + | - + | + | |
| Teacher Feedback | | | | | |
| 23. Correct (+) Ans, Affirmed | + + + + | - | | + | + |
| 24. + Ans, No Response | | | | 2 + + | |
| 25. Failure to Ans +, Terminated | | | - | - | - |
| 26. Failure to Ans +, Sustained | | | | + | + - |
| 27. Student Initiated | + + | - - | + - | + + | |
| 28. Total Private and Public | + | - | - | | |
| 29. Acad with Praise/Total Work Contacts | - | | | | |
| 30. Acad with Criticism/Total Work Contacts | - | - | | - | - |
| High Inference Variables | N=6 | N=6 | N=6 | N=6 | N=6 |
| 1. Withitness | | + | | | |
| 2. Overlappingness | | + | | | |
| 3. Smoothness | | + | | | |
| 4. Momentum | | | | | |
| 5. Clarity | | | | + | |
| 6. Persuasiveness | | | | | |
| 7. Warmth | | | | + | |
| 8. Empathy | | + | | | |

*Productive Behaviors - It was determined that styles E and G in T.D. settings and styles G in N-T.D. settings were productive in terms of Reading Achievement.

+ = positive and significant correlations.
- = negative and significant correlations.

low achievers; (2) students with positive academic self-concept who engaged in productive behaviors in teacher directed settings, initiated interactions with the teacher and received attention and help from the teacher; and (3) teacher initiated private interactions correlate positively more frequently with unproductive student behaviors than they do with productive student behaviors. It is reasonable to suggest that the effects of the reactive nature of teacher behaviors were negative attitudes to school, to instruction and teacher, and to others.

2. Proportions of public interactions were low. They ranged from .15 to .67 in language arts and from .06 to .49 in mathematics. Only two teachers (teacher 4 and 6) had higher proportions of public interactions than private interactions.

Table 45 (see variables 16 to 27) reveals that public interactions consisting of questions that students answered correctly followed by the teacher simply affirming the correct answers, were positively related to pupil achievement and productive behaviors in teacher directed settings and negatively related to pupil attitudes.

Self reference and process questions were positively related to achievement in three classes. Product questions were positively related to achievement in two classes and in one class all three question types were positively related to achievement. Question type and the way the teacher selected a respondent did not appear to be as important as asking questions that students could answer correctly.

3. Praise and criticism occurred infrequently within academic interactions. As expected criticism correlates negatively with

achievement, attitudes and productive behaviors. Praise also correlates negatively with achievement and academic self-concept, suggesting that praise is a reactive response of the teacher to students of low ability and low self-concept.

4. Teachers who were skilled in classroom management and interpersonal warmth generally had students with positive attitudes to the class. More specifically the students did not perceive their class as overly competitive. Management skills also resulted in little withdrawn behaviors by students. Persuasiveness or the teacher's ability to motivate, appeared to be functional in reducing withdrawn and peer dependent behaviors and encouraging productive behaviors in both teacher directed and non-teacher directed settings.

## Conclusions

This investigation of teacher behaviors and pupil outcomes was an attempt to seek answers to the questions posed in Chapter I. The following conclusions are based on the results and discussions contained in Chapter IV and V.

1. Interaction sequences were relatively consistent across subject matter and lesson type. The practice of choosing an interaction sequence or a style of teaching or more broadly a model of teaching, appropriate for specific lesson objectives, subject matter or students, was not evident.

2. The data showing the differential frequency of interaction of various groupings of students suggest that classroom interaction and student effects are cyclical in nature. Student achievement,

attitudes and behaviors are as much a function of classroom interaction as are interactions a function of student effects.

3. The data suggest that drill or recitation lessons are functional for some types of lessons in language arts and mathematics, particularly at the lower grade levels. This type of direct teaching when used to the exclusion of other teaching styles results in negative attitudes to school. Direct teaching may be very appropriate for simple acquisition of facts and it may be allowed that some memorization and drill is boring. But the data in this study suggest that interaction sequences in the direct teaching (drill and recitation) mode were used almost exclusively and therefore were often used inappropriately. It was the extensive use of direct teaching across subjects, and lesson types, with both high and low achievers that seems to account for negative attitudes by the students.

4. Proportionately little opportunity was given for student public expression of opinion. This appeared to be incongruent with at least some language arts lesson objectives, for example, having students predict outcomes, make judgements and inferences, and draw conclusions.

5. Scales developed for the measurement of withitness, overlappingness, smoothness, and momentum (Kounin, 1970) have demonstrated high reliability when used in a variety of classroom contexts. The classroom management skills appear to be important for ensuring positive attitudes and productive pupil behaviors.

## Implications and Recommendations

### Research

1. Greater understanding of what happens in classrooms

requires detailed analysis of teacher and pupil process variables. The interactive phase of teaching needs investigation using low inference multi-category observation systems by in-class observers, video and audiotape recordings of sufficient quality to hear what is being said in each dyadic interaction and to ascertain the amount of time each student has with the teacher.

In addition, video recordings, interview techniques, and anthropological analysis should be used to enrich the description and the study of classroom events. Data were lacking in this study on: teacher perceptions and pupil perceptions of interaction; detailed descriptions of teacher planning; the nature of many of the private teacher-pupil interactions; the nature of the seatwork assignments; the relationship of seatwork to the lesson plans; and the relationship of the quantity and quality of seatwork to pupil behaviors, achievement and attitudes.

2. Classroom interaction studies must use data collection and analysis for each pupil. Studies using group means for analysis mask the unique quality and quantity of interaction, the effects of interaction on individual pupils, and the effects on interaction by individual pupils.

3. In addition to long term product measures used in this study, product measures should be taken at the end of each class by asking the teacher and pupils what was learned, by using brief end of lesson questions and by interviewing students with the aid of the videotaped recordings to determine immediate pupil attitudes to the lesson materials, to the instruction and to the teacher.

Teacher Education

1. Teacher education curriculum is generally characterized by subject matter, curriculum and instruction courses. Yet teachers in this study did not appear to vary their teaching styles or patterns of interaction significantly across subject matter or lesson type. Greater emphasis needs to be given to generic teaching skills and to the purposes and effects of different types of interaction patterns.

2. Because of our lack of knowledge of the relationship between teacher behavior and student outcomes, we need "to teach teachers how to evaluate their own teaching so that they can decide for themselves which skills and strategies for them are most useful. This suggests that learning how to study one's own teaching may well be the most important, single objective in teacher education" (Flanders, 1976).

3. Findings in this study suggested that teacher-pupil interaction was as much a function of student behavior as student behavior was a function of interaction. It is the teacher who has the responsibility to break the reciprocal conditioning process and be "in charge." It is the teacher's role, as prescribed by society, to be the initiator rather than mere reactor. To break the reciprocal nature of teacher-pupil interaction and pupil effects, the teacher requires an understanding of student behavior, training in systematic observation of pupil behaviors and an ability to initiate programs that will encourage productive pupil behaviors. Much could be gained from a closer link between teacher education curriculum and counselor education curriculum.

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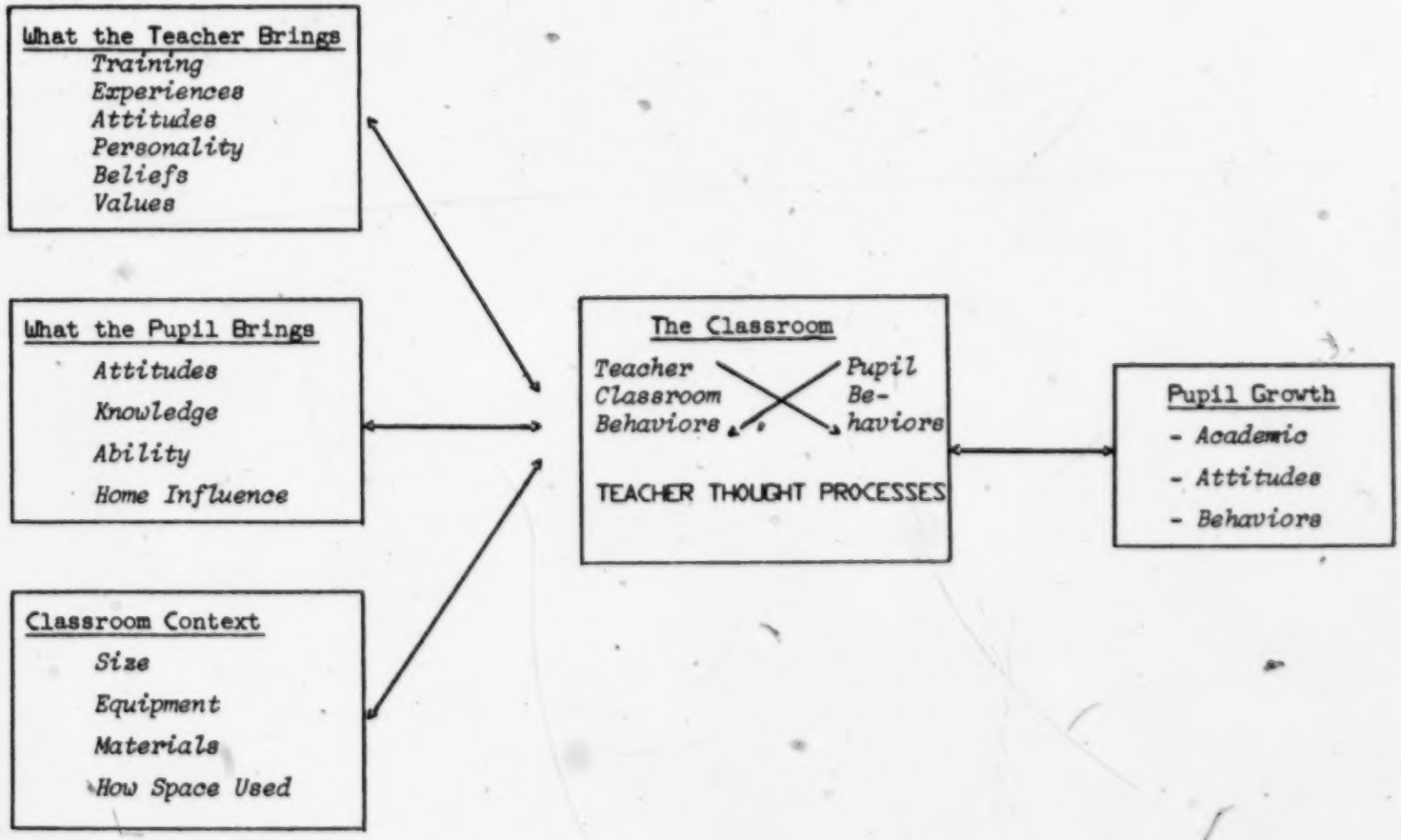
# APPENDICES

# APPENDIX A

## EXPLANATION OF THE STUDY—HANDOUT USED FOR SCHOOL PERSONNEL

## THE STUDY OF TEACHING AND LEARNING



Sample Timetable for ONE Teacher

| Week | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 1 | 1 week informal observation for purposes of familiarization | | | | |
| 2 | 1 1/2 hr a.m. observing | 1 hr p.m. observing | | | |
| 3 | | | | | |
| 4 | | | | | |

## APPENDIX B

## PROCESS DATA—INSTRUMENTS

1. High Inference Rating Scales
2. Rating Sheet
3. Summary of Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction System
4. B and E Coding Sheet
5. CASES (Brief Form for Quick Reference
6. CASES Styles—Worksheet
7. Curriculum Area Methods and Materials

## High Inference Rating Scales

### Withitness

1. The teacher makes frequent errors in attempting to deal with deviant behavior. She may over react to a situation, may react late or not at all (*timing*), may be off target in her reprimands and/or may desist a less serious deviancy while overlooking a more serious deviancy.

2. Between 1 and 3.

3. The teacher sometimes makes errors in attempting to deal with deviant behavior, i.e., *over react, timing, target and minor-major deviancy*, and sometimes makes no errors in desist attempts.

4. Between 3 and 5.

5. The teacher makes few of the above errors in attempting to deal with deviant behavior.

## Smoothness

1. The teacher frequently acts in a manner which interferes with the ongoing *flow* of *academic* events. Actions of the teacher are not goal-oriented. She may pay attention to irrelevant or undue attention to intrusive details (*stimulus-boundedness*). She may *burst in* on children's activities with an order, statement or question (*thrusts*). She may shift back and forth from one activity to another and back again leaving things *hanging in mid-air (dangles and truncations)*.

2. Between 1 and 3.

3. The teacher sometimes acts in a manner which interferes with the ongoing *flow* of *academic* events. Actions of the teacher are sometimes goal-oriented and sometimes are not, i.e., some *stimulus-boundedness, thrusts, dangles and truncations* are evident.

4. Between 3 and 5.

5. The teacher rarely exhibits the above interfering behaviors.

## Overlappingness

1. The teacher almost always attends to only *one* issue at a time. She either remains immersed in one issue or drops it and goes *all out* for another. For example, the teacher, while working with one group, ignores deviant behavior in another group, or ignores intruding children from another group, or goes all out and becomes immersed in the deviance or intrusion.

2. Between 1 and 3.

3. The teacher sometimes attends to more than one issue at a time.

4. Between 3 and 5.

5. The teacher almost always attends to more than one issue at a time. She, while working with one group, is able to deal with deviance and intrusions, verbally and nonverbally.

## Momentum

1. Teacher behaviors frequently *slow down* the pace of the lesson inappropriately. This is done by *overdwelling* on pupil behavior, a subpoint rather than a main point, physical props rather than substance, and on instructions or details to the point of boredom. It is also slowed down by *fragmentation*, i.e., dealing with pupils one at a time when it is appropriate and more efficient to deal with them as a group, or dealing with props one at a time rather than en masse.

2. Between 1 and 3.

3. Teacher behaviors sometimes *slow down* the pace of the lesson by *overdwelling* and *fragmentation*.

4. Between 3 and 5.

5. Teacher behaviors rarely *slow down* the pace of the lesson by *overdwelling* or *fragmentation*.

Persuasiveness (Teacher's Ability to Motivate)

1. The teacher is the kind of person that communicates a socially weak and uninfluential person. She is frequently unable to get students to do work related to the objectives of the lesson.

2. Between 1 and 3.

3. The teacher is the kind of person that communicates an average persuasively powerful person. She is sometimes able to motivate students to work and sometimes unable to do so.

4. Between 3 and 5.

5. The teacher is the kind of person that communicates a socially influential or persuasively powerful person. She is almost always able to get students to do the work related to the objectives of the lesson.

   NOTE: This level does not imply that the teacher has chosen all the *goals* or *objectives* for the student.

## Clarity

1. The teacher, when giving instructions, answering questions or explaining material to the class, is unclear in her presentations. The presentations may be too complex, ambiguous, or make use of unfamiliar or unrelated concepts and terms. Answers given are not specific but are vague or evasive. The teacher uses qualifiers (e.g. maybe, sometimes, it could be, etc.) excessively. The teacher rarely gives appropriate examples, uses illustrations, states objectives, summarizes, or checks for student understanding.

2. Between 1 and 3.

3. The teacher when giving instructions, answering questions or explaining material to the class, is sometimes clear and sometimes unclear in her presentations.

4. Between 3 and 5.

5. The teacher when giving instructions, answering questions or explaining material to the class, is clear in her presentation. Adequate use of examples and illustrations are made, objectives are clearly stated, main points are summarized, and adequate checks of student understanding are made.

## Warmth[1]

1. The teacher gives *explicit* evidence of *rejection* of the student, his ideas, experiences, opinions or feelings. Criticism is harsh and gives *explicit* evidence of a negative feeling for the student expressed by the teacher.

2. The teacher is mechanical and/or passive in her responses. Mild criticism, a lack of concern or ignoring, provide implicit evidence of disinterest in the student.

3. The teacher provides no explicit or implicit evidence of dislike or rejection of the student. She does not criticize nor is there a clear expression of warmth, i.e. there is interest shown but not warmth.

4. The teacher *accepts, allows* pupil ideas, experiences, opinions, and feelings. There is implicit evidence of warmth and respect through praise and encouragement.

5. The teacher gives *explicit* evidence of a deep caring, prizing, and valuing of the student, and this is made clear to the student. Expectations of the student's highest and best is pressed for, indicating a deep respect. Voice tone and manner give evidence of a close relationship.

[1]Adapted from scales authored by C. B. Truax.

## Empathy[1]

1. The verbal and behavioral expressions of the first person either do not attend to, or detract significantly from, the verbal and behavioral expressions of the second person in that they communicate significantly less of the second person's feelings than the second person has communicated himself.

2. While the first person responds to the expressed feelings of the second person, he does so in such a way that he subtracts noticeable affect from the communications of the second person.

3. The expressions of the first person in response to the expressed feelings of the second person are essentially interchangeable with those of the second person in that they express essentially the same affect and meaning.

4. The responses of the first person add noticeably to the expressions of the second person in such a way as to express himself.

5. The first person's responses add significantly to the feeling and meaning of the expressions of the second person in such a way as to (1) accurately express feeling levels below what the person himself was able to express or (2) in the event of ongoing deep self-exploration on the second person's part, to be fully with him in his deepest moments.

[1]Carkhuff Revisions of the Truax Scales.

SCHOOL: _____ DATE: _____ START: _____

TEACHER: _____ OBSERVER: _____ STOP: _____

| VARIABLE | INTERVALS | | | | | | $\bar{X}$ | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | | |
| 1 - W | | | | | | | | |
| 2 - O | | | | | | | | |
| 3 - S | | | | | | | | |
| 4 - M | | | | | | | | |
| 5 - C | | | | | | | | |
| 6 - P | | | | | | | | |
| 7 - W.R. | | | | | | | | |
| 8 - E | | | | | | | | |

## Section I

## Summary of Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

The major aspects of classroom life coded by this system are represented by the four cells in the diagram appearing below. Within each cell are the sub-categories of those four aspects which are then further broken down into still smaller units.

| | Public response opportunities | Private dyadic teacher-pupil contacts |
|---|---|---|
| Teacher afforded | A. | C.<br>I. Work-related<br>II. Personal<br>III. Procedure-related<br>IV. Behavior-related<br>V. Don't know |
| Student initiated | B.<br>I. Student Initiated Questions<br>II. Student Initiated Comments | D.<br>I. Work-related<br>II. Personal-related<br>III. Don't know |

A. Teacher Afforded Response Opportunities

The three key aspects of this category of classroom event are:

(a) they are public interactions between the teacher and a child, intended to be monitored by the class or group with which the teacher is working;

(b) they occur when the teacher asks a question requiring either a verbal or nonverbal response;

(c) only one child makes the response.

For each response opportunity that is coded, information has to be checked off in each of four subcategories: (1) type of response opportunity; (2) level of question asked; (3) quality of child's answer; (4) nature of the teacher's feedback reaction.

(1) Types of response opportunity

Predesignated (PRE): teacher names the child first and then asks a question;

Non volunteer (N. VOL): teacher asks a question first but calls for a response from a child who has not raised his hand;

Volunteer (VOL): teacher asks a question first and invites a response from a child with hand raised;

Called out (CALL): teacher asks a question but a child calls out the answer before the teacher has a chance to select a respondent; the teacher nevertheless responds to the child who called out the answer.

(2) Level of question asked

Process (PCSS): question requiring student to integrate facts or show knowledge of their relationships.

Product (PROD): question for which a specific correct answer is sought.

Choice (CHOIS): question requiring an answer to be selected from one of the alternatives presented.

Self Reference (SELF REF): question requiring child to make a non-academic contribution to the classroom discussion. This type of question has then to be further classified as subject-matter related (SUB) or non subject-matter related (NON SUB) and then whether it requires the child to show a preference (PREF) or to give information about his past experience (EXP).

Opinion: question requiring student to take a position on an issue or to predict the outcome of an experiment or hypothetical situation. If the child gives no response (NR) this is coded. On the other hand if the child does respond, the teacher's reaction to

the answer is coded: if it is praised (‡), criticized (∓), ignored (0), accepted (ACPT), integrated (INTEG) into the ongoing discussion, or if the teacher disagrees (DISAG) with the child's opinion.

(3) Quality of child's answer

The child's answer is coded as correct (+), partially correct (±), incorrect (-), or no response (NR) but, if the child indicates that he doesn't know, this item of information is also coded.

(4) Nature of the teacher's feedback response.[1]

The teacher's reaction to the child's response has been categorized as terminal or sustaining. Reaction which is terminal, that is, it has the effect of terminating the interaction with the child, could be one of seven types. The teacher may praise (‡), criticize (∓), provide no response (NR), give process feedback (PCSS), give the correct answer (GIV ANS), ask another (ASK OTH) child for the answer, or the answer may be called out (CALL) by another student. Reaction which is sustaining, that is, it has the effect of prolonging the interaction, could be one of three kinds. The teacher may repeat the question (REPT Q), rephrase the question or give a clue (REP or CLU), or ask a new question (NEW Q).

B. Student Initiated Response Opportunities

1. Student Initiated Questions

This category of response opportunity is used if the student asks the teacher a question regarding the subject matter under discussion or some other matter. If the student calls out (CALL) the question without prior teacher approval, this point is coded and also if the question is relevant (REL) or irrelevant (IRREL). Two kinds of teacher reaction to the question, praise (‡) and criticism (∓), are coded if they occur, and also types of teacher feedback. The teacher may provide no feedback (0) (i.e. ignore the question), delay (DELAY) her answer, not accept (NACPT) it into the discussion, provide a brief or long answer or she may redirect (RDRCT) the question to another student. Three other categories

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[1] Modifications to the subcategories of teacher feedback as defined in the Expanded Brophy-Good System were made and are reported in Appendix B, Section II, page 204.

praise (‡), criticism (=), and warning (WARN) are provided if the teacher makes a reaction related to the student's behavior in initiating the question.

II. Student Initiated Comments

The details surrounding a student initiated comment that are coded are very similar to those for a student initiated question. All but three teacher response categories, brief, long, and redirect (RDRCT) are retained. They are replaced by another three. The teacher may accept (ACPT) the student comment, integrate (INTEG) it into the class discussion, or may use it to shift the direction of the class discussion.

C. Teacher Afforded Dyadic Contacts

I. Teacher Afforded Contacts (Work-related)

These are instances when the teacher makes private contact with an individual child about his work. Several features of these contacts are coded. The contact may be long, brief or it may be one in which the teacher just observes (OBSV) without entering into verbal interaction. If the contact is a long or brief one, praise (‡) or criticism (=) is coded also if the teacher's comments include such reactions. A don't know (?) category is used if the interaction between teacher and child is not audible to the coder.

II. Teacher Afforded Contacts (Personal)

These contacts do not involve either work content or procedure but are of a strictly personal nature.

III. Teacher Afforded Contacts (Procedure-related)

Within this category a distinction is made between those instances when a teacher seeks a favor (child helps in running the classroom) and those in which the request have to do with getting the child ready to work. The latter are coded as management (MANAG). Thank you (THANKS) is coded if the teacher thanks the child following the management or favor request.

IV. Teacher Afforded Contacts (Behavior-related)

This category is used whenever the teacher makes some comment on the child's classroom behavior. They are subdivided into praise (+), non-verbal intervention (NVI), warnings (WARN), and criticism (=). Errors which the teacher makes when warning a child are also noted. Three kinds of errors, target errors (TARG), timing errors (TIM), and overreactions (OVERT) are coded. The no error category is

used whenever the teacher does not make one of the three errors. Provision also exists for the coder to record his uncertainty (?) if he is not sure that an error has occurred.

V. Don't know (?) is coded if the teacher-pupil communication is inaudible to the coder and the coder is unable to determine which of the above four types of teacher afforded contacts is occurring.

D. Student Initiated Dyadic Teacher-Pupil Contacts (referred to as Child Created Contacts on the coding sheets)

I. Child Created Contacts (Work-related)

This type of contact may relate to work content (CONT) or work procedures (PROC). The teacher's feedback to the child is also coded, whether the teacher offers praise (‡) or criticism (-) and whether the contact is brief, long, or delayed (DELAY) by the teacher.

II. Child Created Contacts (Personal-related)

In this category there are two first-order divisions, experience (EXP) sharing and procedural (PROC). All experience sharing contacts are personal ones in which the student contacts the teacher to tell him something which is not related to either classroom work or procedure. The teacher's response is coded as either acknowledged (ACK) (i.e. the contact is acknowledged by the teacher) or delay (i.e. the teacher indicates she is unable to listen or talk to the pupil at that time).

A procedural contact occurs when the pupil is making a request, offers to do an errand, or reminds the teacher of something. The teacher's reaction is coded as grant or non-grant (N GRANT) (teacher has or has not granted the request) or as delay.

III. Don't Know

If the communication in the child created contact is inaudible to the coder, the don't know (?) column is used.

## Section II

### Definitions of One Modified Category and Two New Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

#### No Feedback Reaction (0)

This category of terminal teacher feedback in the Brophy-Good system has been restricted in meaning in this study. This part of the original statement now embodies its full meaning.

> "If the teacher makes no response whatsoever following the child's answer to the question, he is coded for no feedback reaction (0). This means that he makes no verbal response to the child and does not communicate affirmation or negation by shaking his head in response to the answer. Instead, he merely moves on to something else, perhaps by starting to make a new point or by asking another child a question. Most coders will be surprised to find that this category is used much more often than they had expected. It frequently happens that the teacher makes no feedback reaction at all to the child's answer, especially in fast moving question drills where he is pushing to get correct answers in an impersonal fashion, without paying attention to the individual child giving the answer" (Brophy & Good, 1970, p. 17).

#### Affirmative Teacher Reaction (AFFIRM)

This category of teacher reaction within an academic response opportunity is defined as a terminal teacher reaction which does not go beyond the level of simple affirmation. The teacher simply indicates that the child has given a correct response. He does not communicate a warm personal reaction to the child. There is merely an impersonal communication of information. For example, the teacher repeats the student's answer or thanks the pupil without explicit or implicit praise. The teacher's intent is to terminate student involvement.

#### Repeats Student Statement (REP SS)

This is an additional category in the set of teacher reactions in academic response opportunities described as sustaining. In this category are to be coded all those instances when the teacher repeats the child's answer in a quizzical manner without indicating whether he considers it to be correct or incorrect, or when the teacher restates the pupil answer for the purpose of having the student confirm what he had just said. The principal criterion to be used in distinguishing a Repeats Student Statement is whether the teacher's

intention was to sustain the student's involvement by having the pupil clarify for himself and/or for others the meaning of his previous response.

# B AND E CODING SHEET

SCHOOL: _____ DATE: _____ START: _____ PAGE: _____

TEACHER: _____ OBSERVER: _____ STOP: _____ OF : _____

| | SELF | | | | OPINION | | | | | | | TIME | CHILD | | | | QUEST | | | ANSWER | | | | | | ACADEMIC TERMINAL FEEDBACK | | | | | SUSTAIN | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SUB | | | NON SUB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | PREF | EXP | ? | PREF | EXP | NR | ++ | +- | 0 | DISAG | ACPT | INTEG | | PRE | NVOL | VOL | CALL | PCSS | PROD | CHOIS | + | ++ | - | DK | NR | ++ | +- | 0 | AFFIR | PCSS | GIVANS | ASKOTH | CALL | REPTQ | REPDCLL | NEWC | REPSS |
| 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

STUDENT INITIATED QUESTIONS

| | CALL | REL | IREL | ++ | +- | 0 | DELAY | NACPT | BRIEF | LONG | RDRCT | ++ | +- | WARN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |

STUDENT INITIATED COMMENTS

| | CALL | REL | IREL | ++ | +- | 0 | DELAY | NACPT | ACPT | INTEG | SHIFT | | | WARN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |

TEACHER-AFFORDED CONTACTS

| | WORK - RELATED | | | | | | | PROCEDURE | | | | BEHAVIOR - RELATED | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ++ | - | ? | OBSV | BRIEF | LONG | PERS | FAVOR | MANAG | THANKS | ? | ++ | NVI | WARN | - | NOERROR | TARG | TIM | ? | OVERT |
| 1 | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | |

CHILD-CREATED CONTACTS

| | WORK - RELATED | | | | | | | ? | PERSONAL - RELATED | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CONT | PROC | ++ | - | DELAY | BRIEF | LONG | | EXP | PROC | ACK | GRANT | DELAY | NGRANT |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

## CASES
(Brief Form for Quick Reference)

1 Aggressive Behavior: Direct attack - grabbing, pushing, hitting, pulling, kicking, name-calling; destroying property - smashing, tearing, breaking.

2 Negative (Inappropriate) Attention-Getting Behavior: Annoying, bothering, whining, loud talking (unnecessarily), attention-getting aversive noise-making, belittling, criticizing.

3a 3b or Manipulating, Controlling, and Directing Others: Manipulating, bossing, commanding, directing, enforcing rules, conniving, wheedling, controlling.

4 Resisting: Resisting, delaying; passive aggressive behavior; pretending to conform, conforming to the letter but not the spirit; defensive checking.

5a 5b or Self-Directed Activity: Productive working; reading, writing, constructing with interest; self-directed dramatic play (with high involvement).

6a 6b or Paying Close Attention; Thinking, Pondering: Listening attentively, watching carefully; concentrating on a story being told, a film being watched, a record played; thinking, pondering, reflecting.

7a 7b or Integrative Sharing and Helping: Contributing ideas, interests, materials, helping; responding by showing feelings (laughing, smiling, etc.) in audience situations; initiating conversation.

8a 8b or Integrative Social Interaction: Mutual give and take, cooperative behavior, integrative social behavior; studying or working together where participants are on a par.

9a 9b or Integrative Seeking and Receiving Support, Assistance, and Information: Bidding or asking teachers or significant peers for help, support, sympathy, affection, etc., being helped; receiving assistance.

10 Following Directions Passively and Submissively: Doing assigned work without enthusiasm or great interest; submitting to requests; answering direct questions; waiting for instructions as directed.

11 Observing Passively: Visual wandering with short fixations; watching others work; checking on noises or movements; checking on activities of adults or peers.

12 Responding to Internal Stimuli: Daydreaming; sleeping; rocking or fidgeting (not in transaction with external stimuli).

13 Physical Withdrawal or Passive Avoidance: Moving away; hiding; avoiding transactions by movement away or around; physical wandering avoiding involvement in activities.

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# CASES STYLES-Work Sheet

School_____ Teacher_____ Observer_____ Date_____

Subject (Child's code name)_____ Setting_____

SES f

1 _____
2 _____
3a _____
3b _____
4 _____
5a _____
5b _____
6a _____
6b _____
7a _____
7b _____
8a _____
6b _____
9a _____
9b _____
10 _____
11 _____
12 _____
13 _____

If [ ] (1)

**STYLE A** (Aggressive, manipulative)

c1 _____
c2 _____
c3b _____
c9b _____

Total A _____ (2)

(2) x100/(1) = [ ] (3) %

(3)/4 = [ ] (4)

Visibility A

**STYLE B** (Peer oriented, non-conforming, resistant)

c4 _____
c5b _____
c7b _____
c8b _____

Total B _____ (11)

(11) x100/(1) = [ ] (12) %

(12) /25 = [ ] (13)

Visibility B

**STYLE C** (Withdrawn)

c12 _____
c13 _____

Total C _____ (8)

(8) x100/(1) = [ ] (9) %

(9)/5 = [ ] (10)

Visibility C

**STYLE D** (Peer dependent)

c6b _____
c11 _____

Total D _____ (5)

(5) x100/(1) = [ ] (6) %

(6)/20 = [ ] (7)

Visibility D

**STYLE E** (Adult dependent)

c6a _____
c7a _____
c9a _____

Total E _____ (14)

(14) x100/(1) = [ ] (15) %

(15) /20 = [ ] (16)

Visibility E

**STYLE F** (Social, productive)

c3a _____
c8a _____

Total F _____ (17)

(17) x100/(1) = [ ] (18) %

(18) /20 = [ ] (19)

Visibility F

**Overall Coefficient**

(Range = 1 to 10)

%A_____ x4=_____
%B_____ x3=_____
%C_____ x1=_____
%D_____ x2=_____
%E_____ x7=_____
%F_____ x10=_____
%c5a_____ x8=_____
%c10_____ x5=_____

Σ_____ Σ_____ /100 = [ ] Overall Coeff.

**STYLE G** (Inner-directed, task-oriented)

c5a_____ x 100/(1) = [ ] (20) %

(20) /35 = [ ] (21)

Visibility G

**STYLE H** (Other-directed, task-oriented)

c10_____ x 100/(1) = [ ] (22) %

(22) /30 = [ ] (23)

Visibility H

SCHOOL_____ TEACHER_____ GR._____ DATE_____ OBSERVER_____ P.___ of __

Area and purpose of activity_____ Group size and rank _____

A. Teaching categories
1. Review of old material
2. Presentation of material
3. Practice
4. Summarizing review
5. Teacher evaluation
6. St. self-evaluation
7. Follow-up instruct.
8. Follow-up activity

B. Methods categories
1. Demonstration, diagram
2. Lecture
3. Focussed discussion
4. Unfocussed discussion
5. Pupil read/recitation
6. Drill
7. Problem solving
8. Dead spots
9. Patterned turns
10. Non-patterned turns

C. Materials categories
1. Standardized
2. Teacher created
3. Seatwork/homework
4. AV aids
5. Games/activities
6. Learning centers
7. Excursion
8. Free time

CODES

| | START TIME | A | I P G | B | I P G | C | I P G | ELAPSED TIME |
|---|---|---|---|---|---|---|---|---|
| 1. | | | | | | | | |
| 2. | | | | | | | | |
| 3. | | | | | | | | |
| 4. | | | | | | | | |
| 5. | | | | | | | | |
| 6. | | | | | | | | |
| 7. | | | | | | | | |
| 8. | | | | | | | | |
| 9. | | | | | | | | |
| 10. | | | | | | | | |
| 11. | | | | | | | | |
| 12. | | | | | | | | |
| 13. | | | | | | | | |
| 14. | | | | | | | | |
| 15. | | | | | | | | |
| 16. | | | | | | | | |
| 17. | | | | | | | | |
| 18. | | | | | | | | |
| 19. | | | | | | | | |
| 20. | | | | | | | | |
| 21. | | | | | | | | |
| 22. | | | | | | | | |
| 23. | | | | | | | | |
| 24. | | | | | | | | |
| 25. | | | | | | | | |
| 26. | | | | | | | | |
| 27. | | | | | | | | |
| 28. | | | | | | | | |
| 29. | | | | | | | | |
| 30. | | | | | | | | |
| 31. | | | | | | | | |
| 32. | | | | | | | | |

# APPENDIX C

## INTERCODER RELIABILITY MEASURES—LOW INFERENCE CLASSROOM OBSERVATION SYSTEM

Intercoder Reliability Measures Obtained During Training with the Low Inference Classroom Observation System

| Variable | Check No. | Percentage Agreement: Coders 1 & 2 | | | | | Coders 1 & 3 | | | | | Coders 2 & 3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| **Academic Response Opportunity** | | | | | | | | | | | | | | | | |
| Type of Respondent | | 82 | 100* | 70 | --† | -- | 82 | 70 | 55 | -- | -- | 80 | 70 | 78 | -- | -- |
| Question Type | | 73 | 75 | 71 | -- | -- | 36 | 100 | 33 | -- | -- | 30 | 75 | 33 | -- | -- |
| Child Answer | | 85 | 80 | 64 | -- | -- | 69 | 89 | 58 | -- | -- | 64 | 80 | 78 | -- | -- |
| T. Feedback on PCSS, PROD,CHOIS | | 43 | 67 | 50 | -- | -- | 60 | 78 | 71 | -- | -- | 60 | 67 | 78 | -- | -- |
| T. Feedback on Opinion Q's | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Student Initiated Question** | | | | | | | | | | | | | | | | |
| Type | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Relevancy | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| T. Feedback | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **Student Initiated Comment** | | | | | | | | | | | | | | | | |
| Type | | 100 | -- | -- | -- | -- | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- |
| Relevancy | | 100 | -- | -- | -- | -- | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- |
| T. Feedback | | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- | 66 | -- | -- | -- | -- |
| **Dyadic Contact** | | | | | | | | | | | | | | | | |
| Type | | 100 | -- | -- | 65 | 86 | 64 | -- | -- | 76 | 92 | 64 | -- | -- | 84 | 92 |
| **Child Created Contact (CCC)** | | | | | | | | | | | | | | | | |
| Type | | 100 | -- | -- | 90 | 83 | 0 | -- | -- | 87 | 95 | 0 | -- | -- | 96 | 79 |
| CCC (WK-REL) | | | | | | | | | | | | | | | | |
| T. Reaction (DELAY, BRIEF, LONG) | | 100 | -- | -- | 79 | 86 | 0 | -- | -- | 100 | 88 | 0 | -- | -- | 79 | 78 |
| T. Reaction (‡, =) | | -- | -- | -- | -- | 56 | -- | -- | -- | -- | 45 | -- | -- | -- | -- | 78 |
| CCC (PERS-REL) | | | | | | | | | | | | | | | | |
| Type | | -- | -- | -- | 25 | 50 | -- | -- | -- | 43 | 50 | -- | -- | -- | 50 | 75 |
| T. Reaction (ACK, DELAY) | | -- | -- | -- | -- | 0 | -- | -- | -- | -- | 100 | -- | -- | -- | -- | 0 |
| T. Reaction (GRANT, NONGRANT) | | -- | -- | -- | 25 | 33 | -- | -- | -- | 43 | 0 | -- | -- | -- | 50 | 0 |
| **Teacher Afforded Contact (TAC)** | | | | | | | | | | | | | | | | |
| Type | | 89 | -- | -- | 45 | 73 | 58 | -- | -- | 60 | 92 | 57 | -- | -- | 71 | 73 |
| TAC (WK-REL) | | | | | | | | | | | | | | | | |
| Type (OBSV, BRIEF, LONG) | | -- | -- | -- | 31 | 60 | -- | -- | -- | 32 | 50 | -- | -- | -- | 59 | 67 |
| T. Reaction (‡, =) | | -- | -- | -- | 33 | -- | -- | -- | -- | 33 | -- | -- | -- | -- | 100 | -- |
| TAC (PROC-REL) | | | | | | | | | | | | | | | | |
| Type (MANAG, FAVOR) | | 78 | -- | -- | 56 | 33 | 78 | -- | -- | 78 | 100 | 100 | -- | -- | 45 | 33 |
| TAC (BEH-REL) | | | | | | | | | | | | | | | | |
| Type (‡, NVI, WARN, =) | | 0 | -- | -- | 67 | 60 | 20 | -- | -- | 57 | 50 | 0 | -- | -- | 71 | 33 |
| Error Type | | 0 | -- | -- | 67 | 60 | 20 | -- | -- | 57 | 50 | 0 | -- | -- | 71 | 33 |

*Percentage agreements which are underlined indicate calculations based on frequencies of less than 10 for a given event.

†A dash in a cell represents 100% agreement between coders that the event did not occur.

Intercoder Reliability Measures Obtained during Data Collection with the Low Inference Classroom Observation System

| Variable | Check No. | Percentage Agreement: Coders 1 & 2 | | | Coders 1 & 3 | | | | | | Coders 2 & 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 |
| **Academic Response Opportunity** | | | | | | | | | | | | | | |
| Type of Respondent | | 50* | 85 | --† | 20 | 50 | 33 | 79 | 0 | -- | 50 | 91 | 71 | -- |
| Question Type | | 88 | 86 | -- | 33 | 55 | 50 | 83 | 33 | -- | 77 | 89 | 82 | 33 |
| Child Answer | | 50 | 85 | -- | 33 | 52 | 33 | 89 | 100 | -- | 50 | 90 | 75 | -- |
| T. Feedback on PCSS, PROD, CHOIS | | 50 | 73 | -- | 25 | 66 | 33 | 74 | 100 | -- | 39 | 76 | 69 | -- |
| T. Feedback on Opinion Q's | | -- | -- | -- | 0 | 18 | 100 | 100 | -- | -- | -- | 60 | -- | -- |
| **Student Initiated Question** | | | | | | | | | | | | | | |
| Type | | 72 | -- | -- | -- | 50 | 0 | 57 | 100 | 43 | 33 | -- | -- | 40 |
| Relevancy | | 72 | -- | -- | -- | 57 | 33 | 71 | 50 | 60 | 33 | -- | -- | 60 |
| T. Feedback | | 63 | -- | -- | -- | 50 | 33 | 71 | 100 | 29 | 33 | -- | -- | 80 |
| **Student Initiated Comment** | | | | | | | | | | | | | | |
| Type | | 33 | 0 | 100 | 67 | 50 | 50 | 42 | 71 | 40 | 43 | 40 | 20 | 50 |
| Relevancy | | 45 | 0 | 100 | 50 | 50 | 25 | 56 | 75 | 60 | 71 | 80 | 100 | 44 |
| T. Feedback | | 56 | 0 | 100 | 33 | -- | 27 | 13 | 57 | 100 | 71 | 60 | 60 | 44 |
| **Dyadic Contact** | | | | | | | | | | | | | | |
| Type | | 84 | 100 | 73 | 67 | 20 | 56 | 85 | 88 | 83 | 73 | 56 | 83 | 89 |
| **Child Created Contact (CCC)** | | | | | | | | | | | | | | |
| Type | | 62 | -- | 69 | 100 | 0 | 39 | 40 | 81 | 80 | 100 | 0 | 100 | 80 |
| CCC (WK-REL) | | | | | | | | | | | | | | |
| T. Reaction (DELAY, BRIEF, LONG) | | 56 | -- | 41 | 75 | -- | 29 | 50 | 79 | 67 | 0 | 0 | 100 | 71 |
| T. Reaction (↕, ∴) | | -- | -- | -- | -- | -- | 100 | -- | -- | 0 | -- | -- | -- | -- |
| CCC (PERS-REL) | | | | | | | | | | | | | | |
| Type | | 0 | -- | 17 | -- | 0 | 20 | 0 | 58 | 38 | 0 | -- | 100 | 50 |
| T. Reaction (ACK, DELAY) | | -- | -- | 0 | -- | 0 | 20 | -- | 33 | 33 | 0 | -- | -- | 0 |
| T. Reaction (GRANT, NONGRANT) | | 0 | -- | 20 | -- | -- | -- | 0 | 33 | -- | 0 | -- | 100 | 20 |
| **Teacher Afforded Contact (TAC)** | | | | | | | | | | | | | | |
| Type | | 76 | 100 | 74 | 59 | 22 | 42 | 77 | 90 | 55 | 67 | 43 | 80 | 85 |
| TAC (WK-REL) | | | | | | | | | | | | | | |
| Type (OBSV, BRIEF, LONG) | | 46 | -- | 33 | 25 | -- | -- | 67 | 83 | 50 | -- | -- | 60 | 40 |
| T. Reaction (↕, ∴) | | -- | -- | -- | 0 | -- | -- | -- | 43 | 60 | -- | -- | -- | 100 |
| TAC (PROC-REL) | | | | | | | | | | | | | | |
| Type (MANAG, FAVOR) | | 56 | -- | 50 | 60 | 22 | 33 | 100 | 88 | 20 | 100 | 0 | 100 | 89 |
| TAC (BEH-REL) | | | | | | | | | | | | | | |
| Type (↕, NVI, WARN, ∴) | | 0 | 100 | 0 | 20 | 0 | 40 | 50 | 50 | 50 | 0 | 57 | 50 | 50 |
| Error Type | | 0 | 100 | 0 | 60 | -- | 33 | 50 | 78 | 50 | 0 | 45 | 100 | 50 |

*Percentage agreements which are underlined indicate calculations based on frequencies of less than 10 for a given event.

†A dash in a cell represents 100% agreement between coders that the event did not occur.

# APPENDIX D

## ACHIEVEMENT—TEACHER RANKINGS

ACHIEVEMENT—TEACHER RANKINGS

Sample 1

Please rank order your students according to how well they *achieved* given the goals you had for them this year. (i.e. *take the student's ability level into account when considering achievement.*) During the year you have probably formed expectations for each student regarding *his/her* achievement. Please group the students into one of the following 5 categories: *greatly exceeded expectations* (G), *exceeded expectations* (E), *met expectations* (M), *fell below expectations* (B), *and fell far below expectations* (F). Put the letter for each student's group membership in the RANK column. Then rank the subjects *within* each group, where rank #1 is the highest, rank #2 is the second highest, etc., and place this number in the RANK column as well.

LANGUAGE ARTS*

| | Students | Rank | Comments |
|---|---|---|---|
| 1. | _____ | _____ | _____ |

Sample 2

If you were to give (or did give) a year end test, please rank your students according to how well you think they would *achieve* (or according to how well they did achieve).

LANGUAGE ARTS*

| | Students | Rank | Comments |
|---|---|---|---|
| 1. | _____ | _____ | _____ |

*The same procedures were used for both language arts and mathematics.

# APPENDIX E

## TABLES E-1 TO E-6

## BEHAVIORAL STYLES A - H AS DETERMINED BY CASES DATA IN TWO SETTINGS

TABLE E-1

CLASS 1 - BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS

| Students | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1 | 0.0 | .1942 | .1942 | .3883 | 2.8641* | 0.0 | 0.0 | .9709 | 0.0 | 0.0 | 0.0 | .1866 | .1866 | .0373 | 2.4733 | .1741 |
| 2 | 0.0 | .4341 | .7752 | .1938 | 1.2791 | .0775 | .0443 | 1.7571 | .2193 | .4561 | .1754 | .3070 | .2412 | .3070 | 1.7920 | .2339 |
| 3 | 0.0 | .3889 | .5556 | .1389 | 1.5278 | .0347 | 0.0 | 1.7824 | 0.0 | .2483 | .1379 | .6897 | .5172 | .0345 | 1.4187 | .6207 |
| 4 | 1.1450 | .3969 | 0.0 | .3053 | 1.6031 | .0382 | 0.0 | 1.5522 | .2717 | .1449 | .2174 | .4529 | .3804 | .1087 | 1.9565 | .2295 |
| 5 | 0.0 | .0417 | .2083 | .2083 | 1.8229 | .0521 | .0298 | 1.8403 | 0.0 | .1948 | .2996 | .8427 | .4869 | .1698 | 1.7121 | .1373 |
| 6 | 0.0 | .7547 | 0.0 | .3302 | .5189 | .0472 | .0270 | 2.0755 | 0.0 | .1379 | .3941 | .7635 | .1232 | .0739 | 1.9986 | .1626 |
| 7 | 0.0 | .1404 | 0.0 | .2193 | 1.3158 | .0439 | 0.0 | 2.1637 | 0.0 | .0497 | .1242 | .7143 | .0621 | .2174 | 2.0941 | .1656 |
| 8 | 0.0 | .0870 | 0.0 | .8696 | 1.1413 | 0.0 | 0.0 | 1.9203 | 0.0 | .4675 | .3896 | .8117 | .2273 | .3896 | 1.3173 | .3896 |
| 9 | 0.0 | .1043 | .1739 | .1739 | 2.2609 | 0.0 | .1988 | 1.3623 | 0.0 | .1302 | .2791 | .3023 | .1395 | .1860 | 2.2458 | .1395 |
| 10 | .5882 | .1412 | 0.0 | .5294 | 2.2353 | 0.0 | 0.0 | 1.2941 | .1179 | .1509 | .0943 | .2594 | .1887 | .2123 | 2.2237 | .1572 |
| 11 | 0.0 | .1882 | 0.0 | .4706 | 2.5882 | 0.0 | 0.0 | 1.1373 | 0.0 | .0421 | .2105 | .7632 | .2105 | .1053 | 2.1353 | .0526 |
| 12 | 0.0 | .0537 | .5369 | .1007 | 1.1074 | .1007 | .0192 | 2.3042 | 0.0 | 0.0 | .5405 | 1.2432 | .2432 | .0811 | 1.8224 | .0721 |
| 13 | 0.0 | .3636 | .1818 | .4091 | 1.4545 | 0.0 | 0.0 | 1.7576 | .3378 | .3604 | .0901 | .2928 | .2477 | .1802 | 2.0335 | .1201 |
| 14 | 0.0 | .3697 | 0.0 | .1681 | 1.3025 | .0840 | .1441 | 1.8207 | 0.0 | .0244 | .3659 | .2439 | .1220 | .0610 | 2.3868 | .1829 |
| 15 | 0.0 | .5565 | .5217 | .3043 | 1.3478 | .0435 | .0745 | 1.5652 | .1582 | .0759 | .1266 | .5696 | .1899 | .1266 | 2.0615 | .2321 |
| 16 | 0.0 | .2202 | .5505 | .1835 | 2.1560 | .0459 | .0786 | 1.3761 | 0.0 | .0825 | .3093 | .3608 | .2577 | .1804 | 2.1944 | .1203 |
| 17 | 0.0 | .4231 | 0.0 | .6250 | 2.4519 | .0481 | 0.0 | .8974 | 0.0 | .1228 | .5263 | .8991 | .4167 | .0658 | 1.8045 | .1170 |
| 18 | 0.0 | .1869 | .1869 | .2336 | .8411 | .0935 | 0.0 | 2.3676 | 0.0 | .0474 | .0791 | .3755 | .1383 | .3162 | 2.1118 | .2635 |
| 19 | .3788 | .2424 | .3030 | .3030 | .5303 | 0.0 | 0.0 | 2.4747 | 0.0 | .1975 | .1852 | .5864 | .3241 | .1543 | 2.0176 | .0823 |
| 20 | .6637 | .1416 | 0.0 | .3097 | .6637 | 0.0 | 0.0 | 2.4779 | .1046 | .4017 | .0837 | .5230 | .3975 | .0418 | 1.6737 | .3766 |
| 21 | 0.0 | .1379 | 0.0 | .2874 | 3.3908 | 0.0 | 0.0 | .7663 | 0.0 | .1657 | 0.0 | .5621 | .1183 | .2071 | 2.1978 | .0394 |
| 22 | .1220 | .2146 | 0.0 | .1463 | 3.6829 | .0244 | 0.0 | .5691 | .2688 | .1505 | .1075 | .3763 | .2419 | .3495 | 1.9509 | .2332 |
| 23 | 0.0 | .1579 | 0.0 | .4605 | 3.0921 | 0.0 | 0.0 | .8333 | .8108 | .5189 | 1.1892 | 1.2162 | .1081 | .1892 | 1.3282 | .0360 |
| 24 | 0.0 | .2532 | 0.0 | .1899 | 1.8987 | 0.0 | 0.0 | 1.7300 | .1445 | .2775 | .1156 | .7514 | .5491 | .2312 | 1.4038 | .4046 |
| 25 | 0.0 | .1242 | .3727 | .1242 | 1.4286 | .0621 | 0.0 | 2.0911 | .2475 | .1386 | .2970 | .8168 | .3465 | .2228 | 1.7822 | .1320 |
| 26 | .2358 | .0755 | 0.0 | .1415 | 2.6415 | 0.0 | .0809 | 1.2893 | .2203 | .0705 | .6167 | .2423 | .2863 | .1101 | 2.3033 | .0294 |
| 27 | 0.0 | .1709 | .6838 | .2137 | 2.4632 | 0.0 | .0244 | .9972 | .1908 | .2290 | .0763 | .2290 | .2481 | .3053 | 2.1483 | .0763 |

*Underlining indicates visible behavioral styles, that is, where the style coefficient is greater than 1.0.

TABLE E-2

CLASS 2 - BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS

| Students | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1 | 0.0 | .1221 | .7634 | .9924 | 2.4046* | .1527 | .0218 | .7125 | .9479 | .3223 | .0948 | .0948 | .2133 | .4739 | 2.0176 | .0474 |
| 2 | .3125 | .2750 | .3750 | .4688 | .7813 | .3750 | .0179 | 1.8542 | 0.0 | .0769 | .3846 | .3526 | .2244 | .2564 | 2.2711 | 0.0 |
| 3 | 0.0 | .7586 | 1.2069 | .8621 | .8190 | 0.0 | .0493 | 1.3218 | 0.0 | .1156 | .9249 | 1.0694 | .1445 | .8671 | 1.1230 | .3854 |
| 5 | 0.0 | .0816 | 1.0884 | .4422 | 1.4966 | .0680 | .0194 | 1.7234 | .1563 | .2000 | 0.0 | .2188 | .2500 | 1.4063 | 1.4643 | .1875 |
| 6 | 0.0 | .0597 | 1.3433 | .0746 | 1.7164 | 0.0 | .0426 | 1.8159 | 0.0 | .0960 | .3200 | .4800 | .1200 | .9600 | 1.8514 | 0.0 |
| 7 | 0.0 | .2025 | .1266 | .0949 | 1.4557 | .0949 | .0542 | 1.9831 | 0.0 | .0976 | .1220 | .0305 | .1524 | .0698 | 2.2035 | .2033 |
| 8 | 0.0 | .3824 | 0.0 | .1471 | 2.2794 | .0368 | 0.0 | 1.3725 | .8621 | .5747 | .1149 | .1149 | .1724 | 1.4943 | 1.2479 | .0766 |
| 9 | 0.0 | .7304 | 1.0435 | .9130 | 1.2174 | 0.0 | .0745 | 1.0435 | 0.0 | .0952 | .7143 | .2679 | .5060 | 1.3988 | 1.3605 | .0992 |
| 10 | 0.0 | .4275 | 1.0687 | .2290 | 2.5954 | 0.0 | .1091 | .7888 | .1488 | .1190 | 0.0 | .2679 | .1786 | .7143 | 2.0408 | .0595 |
| 11 | 0.0 | .2051 | .1709 | .2991 | 2.9487 | .0427 | .0244 | .9117 | 0.0 | .0769 | .0962 | .1683 | .2885 | 1.2260 | 1.7170 | .1282 |
| 12 | .1923 | .5538 | .3077 | .2692 | 1.3462 | .0769 | .1538 | 1.4872 | .3067 | .0245 | 0.0 | .1227 | .2147 | 1.2270 | 1.8755 | .0429 |
| 13 | 0.0 | .1203 | 0.0 | .3759 | 1.7293 | .3008 | 0.0 | 1.6291 | .1689 | .2703 | 0.0 | .5405 | .1351 | .8108 | 1.7954 | 0.0 |
| 14 | 0.0 | .7007 | 1.4599 | .4745 | 1.2774 | .2190 | 0.0 | 1.1922 | 0.0 | .0214 | .1070 | .2406 | .1337 | 1.1497 | 1.9404 | .0178 |
| 15 | 0.0 | .4776 | .8955 | .3358 | 1.4552 | .2239 | 0.0 | 1.4428 | .5708 | .2740 | .2740 | .6621 | .3653 | 1.1872 | 1.2133 | .0913 |
| 16 | .3731 | .2687 | .2985 | .3358 | .8582 | .0373 | 0.0 | 2.1891 | .1429 | .0686 | 0.0 | .3714 | .2857 | 1.3714 | 1.5347 | .1143 |
| 17 | .5639 | .5113 | 1.0526 | .6391 | 2.1805 | .0376 | 0.0 | .7519 | .6667 | 0.0 | .2667 | .0667 | .2667 | 1.7333 | 1.5238 | .0444 |
| 18 | 0.0 | .5113 | 1.2030 | .8271 | 1.5789 | .0376 | 0.0 | 1.0777 | 0.0 | .2198 | .6593 | .7692 | .3297 | .6593 | 1.5699 | .0366 |
| 19 | .1524 | .4878 | .3659 | .5183 | 2.1341 | .0305 | .0348 | 1.0163 | .3472 | .0833 | 0.0 | .0347 | .9028 | .4167 | 1.7460 | .2778 |
| 20 | 0.0 | .1000 | .5000 | .8750 | 1.0000 | .0938 | .0357 | 1.8125 | 0.0 | .0548 | .1370 | .7190 | .1027 | .7192 | 1.8982 | .0228 |
| 21 | .1515 | .0465 | 0.0 | .0909 | 1.0000 | .1515 | .0519 | 2.3838 | 0.0 | 0.0 | 0.0 | .0621 | .3727 | 1.2733 | 1.7746 | .1242 |
| 22 | .2083 | .4000 | .3333 | .8333 | 2.3333 | .0833 | .0714 | .6667 | .3165 | .0844 | 0.0 | .1899 | .2954 | 1.1814 | 1.6878 | .1406 |

*Underlining indicates visible behavior styles, that is, where the style coefficient is greater than 1.0.

TABLE E-3

CLASS 1 - BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS

| Students | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1 | 0.0 | .7089 | .5063 | 1.3924* | .2532 | .0633 | .0362 | 1.4768 | 0.0 | .3243 | .2703 | .1351 | .0676 | 1.4189 | 1.6216 | .0450 |
| 2 | 0.0 | .4632 | .6316 | .7368 | .5263 | 0.0 | 0.0 | 2.0000 | 0.0 | .0714 | 0.0 | .5357 | .3571 | .8036 | 1.7857 | .0595 |
| 3 | 0.0 | .4000 | .3333 | .3333 | 1.1667 | .0833 | .0476 | 1.8333 | 0.0 | .7931 | 1.3793 | .7759 | .2155 | .3448 | 1.3054 | .0287 |
| 4 | .2941 | .7059 | 0.0 | .6471 | 1.4706 | 0.0 | .0336 | 1.2549 | 0.0 | .8767 | .8219 | .4795 | .2740 | .2740 | 1.1353 | .4566 |
| 5 | 0.0 | .6207 | .3448 | .5172 | .6897 | 0.0 | .0493 | 1.8966 | 0.0 | 1.1071 | 1.2500 | .5804 | .1339 | .1786 | 1.1480 | .2679 |
| 6 | 0.0 | .2581 | .9677 | .8065 | .4032 | 0.0 | .7373 | 1.2903 | 0.0 | .0519 | .2597 | .3247 | .1299 | 0.0 | 2.3006 | .2597 |
| 7 | 0.0 | .6275 | 0.0 | .6863 | 1.0294 | 0.0 | .1681 | 1.4706 | 0.0 | .6923 | .1923 | .6731 | .0481 | .1442 | 1.7857 | .0641 |
| 8 | 0.0 | .6957 | 0.0 | .4348 | 0.0 | 0.0 | 0.0 | 2.4638 | 0.0 | .3429 | .1143 | .7714 | .2571 | .2000 | 1.8776 | .0190 |
| 9 | .3165 | .1519 | .2532 | .3797 | 1.0127 | 0.0 | 0.0 | 2.1941 | 0.0 | .3038 | 1.0127 | .5696 | .1266 | .5696 | 1.6037 | .1266 |
| 10 | 0.0 | .5926 | 1.1111 | .8333 | .8333 | 0.0 | .1058 | 1.4198 | 0.0 | .1081 | 0.0 | .2703 | .8108 | .4054 | 1.8533 | .0901 |
| 11 | 0.0 | .2791 | 1.3953 | .5814 | .4651 | 0.0 | 0.0 | 2.1705 | 0.0 | .2105 | .1754 | 1.2719 | .2193 | .0439 | 1.7544 | .0585 |
| 12 | 0.0 | .7941 | 0.0 | .3676 | .2941 | 0.0 | .2731 | 1.9118 | 0.0 | .4571 | .5714 | 1.1905 | .0476 | .0952 | 1.6054 | .0952 |
| 13 | .5435 | .9565 | 1.0870 | .5435 | .7065 | 0.0 | .0932 | 1.3406 | 0.0 | .6897 | 1.1494 | .9770 | .4023 | .0575 | 1.2839 | .1149 |
| 14 | 0.0 | .6545 | 1.6364 | .4545 | .1818 | 0.0 | 0.0 | 2.0909 | 0.0 | .7059 | .9412 | .7059 | .0588 | .4706 | 1.4454 | .0784 |
| 15 | 0.0 | .4267 | 1.3333 | 1.2667 | .5333 | .0667 | .3048 | 1.1556 | .3289 | .5263 | .2632 | 1.6447 | 0.0 | .2632 | 1.2406 | .0877 |
| 16 | 0.0 | 0.0 | 0.0 | .2381 | 1.6667 | 0.0 | .4082 | 1.5873 | 0.0 | .7333 | .1667 | .6667 | .0417 | .2500 | 1.7143 | .0556 |
| 17 | 0.0 | .5714 | 1.6327 | .3061 | .9864 | 0.0 | .1166 | 1.5873 | .1969 | 1.0079 | .1575 | .5906 | .0394 | .0787 | 1.4623 | .2625 |
| 18 | 0.0 | .7040 | .3200 | .2000 | .2400 | 0.0 | .1143 | 2.2667 | 0.0 | .0440 | .4396 | 1.0440 | .2198 | 1.4286 | 1.1931 | .0366 |
| 19 | 0.0 | .1509 | 0.0 | .4717 | .8491 | 0.0 | 0.0 | 2.3270 | 0.0 | .4746 | 0.0 | .0847 | .0847 | .4237 | 1.9855 | .2260 |
| 20 | 0.0 | .8000 | .8000 | 1.1000 | .8000 | 0.0 | .0571 | 1.2000 | 0.0 | .7143 | .3571 | .7143 | .0893 | .0893 | 1.6327 | .1786 |
| 21 | 0.0 | .8056 | .2778 | .6250 | .4514 | .0347 | .0595 | 1.8056 | 0.0 | .1364 | .4545 | .2841 | .0568 | 1.4773 | 1.6234 | 0.0 |
| 22 | 0.0 | .1563 | 0.0 | .3125 | 1.3281 | 0.0 | 0.0 | 2.1094 | 0.0 | .9412 | .3922 | .4412 | .2941 | .2451 | 1.5476 | .0327 |
| 23 | .7353 | .4706 | .5882 | .2941 | 1.0294 | 0.0 | 0.0 | 1.8627 | 0.0 | .4228 | .3252 | .5285 | .3252 | .2846 | 1.4228 | .4878 |
| 24 | 0.0 | .2759 | .3448 | .9052 | .5603 | 0.0 | .0493 | 2.0115 | 0.0 | .6567 | .2985 | .2985 | .0746 | .1493 | 1.6631 | .4478 |
| 25 | 0.0 | .8571 | .4762 | .4167 | .4167 | 0.0 | 0.0 | 1.9841 | .2083 | .9333 | 1.0000 | 1.2083 | .5417 | 0.0 | .8810 | .1667 |
| 26 | 0.0 | 0.0 | 0.0 | .2632 | 2.6316 | 0.0 | 0.0 | 1.4035 | 0.0 | .8403 | 0.0 | 1.3445 | .0420 | .2521 | 1.2965 | .0250 |
| 27 | 0.0 | 1.3012 | .2410 | .9036 | .4819 | 0.0 | 0.0 | 1.2851 | 0.0 | .4494 | .6742 | .8989 | .1124 | .9551 | 1.3162 | 0.0 |
| 28 | 0.0 | 1.0549 | 1.7582 | .8791 | .2198 | .0549 | .0314 | 1.3553 | .2688 | .4301 | .2151 | .3226 | 0.0 | .3226 | 2.0358 | .0358 |
| 29 | 0.0 | .2783 | 1.0435 | .6087 | .8261 | .0870 | 0.0 | 1.9130 | 0.0 | .4494 | .8989 | .2809 | .2247 | 0.0 | 2.0867 | .0375 |
| 30 | 0.0 | .3846 | .1923 | .9615 | .4808 | 0.0 | 0.0 | 2.0192 | .3125 | .9500 | .7500 | .8125 | .3125 | .3750 | .8571 | .3750 |
| 31 | 0.0 | .6545 | .3636 | 1.0909 | .3636 | .0909 | 0.0 | 1.6970 | .2137 | .1368 | .1709 | .3846 | .0427 | .7692 | 1.9536 | .0855 |

*Underlining indicates visible behavioral styles, that is, where the style coefficient is greater than 1.0.

TABLE E-4

CLASS 4 - BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS

| Students | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1 | 0.0 | .0825 | .2062 | .3608 | .6186 | 0.0 | .0295 | 2.5430* | 0.0 | .0889 | 0.0 | .5000 | .1111 | 0.0 | 2.4127 | .0370 |
| 2 | 0.0 | .5760 | .6400 | .2800 | 1.1200 | 0.0 | 0.0 | 1.8133 | .2119 | .5424 | 3.2203 | 1.6949 | .0847 | .0424 | .7990 | .1695 |
| 3 | 0.0 | .3684 | .5263 | .1974 | .6579 | 0.0 | .2256 | 2.1053 | 0.0 | .1975 | 0.0 | .2469 | .1235 | .8642 | 2.0106 | 0.0 |
| 4 | 0.0 | .8235 | .5882 | .2941 | .5882 | 0.0 | 0.0 | 1.9608 | 0.0 | .4000 | 0.0 | .0833 | .1667 | 0.0 | 2.3810 | .0556 |
| 5 | 0.0 | .1165 | .9709 | .5825 | .6311 | 0.0 | .3051 | 1.9094 | 0.0 | .1975 | .2469 | .6173 | 0.0 | 0.0 | 2.3250 | 0.0 |
| 6 | 0.0 | .1626 | .3252 | .2033 | .8130 | 0.0 | .0465 | 2.4119 | 0.0 | .5313 | .6250 | 1.2109 | .1172 | .0781 | 1.3839 | .2344 |
| 7 | 0.0 | .1879 | 0.0 | .2013 | .8389 | 0.0 | .1342 | 2.3266 | 0.0 | 0.0 | 0.0 | .1250 | .2500 | .3750 | 2.4286 | 0.0 |
| 8 | 0.0 | 0.0 | .4196 | .6294 | .9091 | 0.0 | .1199 | 2.0979* | 0.0 | .2667 | 0.0 | .5833 | .0833 | 0.0 | 2.2857 | 0.0 |
| 9 | .3378 | .1622 | .5405 | .0676 | 2.4324 | 0.0 | 0.0 | 1.3964 | 0.0 | 0.0 | 2.8571 | 1.6667 | 0.0 | 0.0 | 1.4966 | 0.0 |
| 10 | 0.0 | .0630 | 1.2598 | .8268 | .3150 | .0394 | 0.0 | 2.2835 | 0.0 | .1101 | 0.0 | .7339 | .1376 | .0917 | 2.0183 | .2446 |
| 11 | 0.0 | .1928 | 0.0 | .0602 | 1.5663 | 0.0 | 0.0 | 2.0884 | 0.0 | 0.0 | 0.0 | .1235 | .9259 | 0.0 | 1.8695 | .4527 |
| 12 | 0.0 | .6000 | 1.4000 | .9500 | .6500 | 0.0 | 0.0 | 1.5333 | .2551 | .4082 | 2.2449 | .7653 | .7143 | .1020 | .7289 | .6803 |
| 13 | 0.0 | .1231 | 0.0 | .2308 | 1.1538 | .0769 | 0.0 | 2.2564 | 0.0 | .3529 | 0.0 | .3676 | .2206 | .3676 | 1.8908 | .1961 |
| 14 | 0.0 | .3404 | 2.5532 | .8511 | .3191 | .0532 | .0608 | 1.7376 | 0.0 | .2133 | .2667 | .4000 | .4667 | .2667 | 1.3714 | .7556 |
| 15 | 0.0 | 0.0 | .4000 | .3500 | .8000 | 0.0 | 0.0 | 2.5000 | 0.0 | .0308 | .4615 | .8846 | .0385 | 0.0 | 2.0000 | .2821 |
| 16 | 0.0 | 0.0 | .1942 | .3883 | 1.5049 | 0.0 | 0.0 | 2.0388 | 0.0 | .2623 | 0.0 | .2459 | .1639 | .4098 | 1.8267 | .4372 |
| 17 | 0.0 | .1887 | 0.0 | .1415 | 1.7453 | 0.0 | 0.0 | 1.9182 | 0.0 | 0.0 | 0.0 | .0847 | .3390 | 0.0 | 2.3729 | .2825 |
| 18 | 0.0 | .1017 | .1695 | .5932 | 1.1441 | 0.0 | .1453 | 1.8927 | 0.0 | .1758 | 0.0 | .0549 | .1099 | .2198 | 2.4804 | .0366 |
| 19 | .2358 | .1132 | 1.6981 | 1.2264 | .2358 | 0.0 | 0.0 | 1.9497 | 0.0 | .4082 | .8163 | .9184 | .1020 | .1531 | 1.7201 | .0680 |
| 20 | .2212 | .1416 | .1770 | .3097 | 1.2389 | .0442 | 0.0 | 2.0944 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8571 | 0.0 |
| 21 | 0.0 | .0268 | 0.0 | .1007 | 1.7785 | 0.0 | 0.0 | 2.0582 | 0.0 | .0404 | .2020 | .7071 | 0.0 | 0.0 | 1.7893 | .7071 |
| 22 | 0.0 | .0845 | 0.0 | .4930 | .4577 | 0.0 | .1207 | 2.4883 | 0.0 | .1333 | 0.0 | .1667 | .0833 | 0.0 | 2.6190 | 0.0 |
| 23 | 0.0 | .0741 | 1.8519 | 1.2037 | .3704 | 0.0 | 0.0 | 1.9136 | 0.0 | .1333 | .2222 | .5556 | .4444 | .0556 | 2.1270 | 0.0 |
| 24 | .1667 | .2133 | 1.3333 | .5000 | .9667 | 0.0 | 0.0 | 1.9333 | 0.0 | .2353 | .3361 | .7983 | .0420 | 0.0 | 2.1609 | 0.0 |
| 25 | 0.0 | 0.0 | .6173 | .1235 | 1.3889 | 0.0 | .0529 | 2.1605 | 0.0 | .1311 | 0.0 | .1639 | .0820 | .3279 | 2.4356 | 0.0 |
| 26 | .8197 | .3607 | .3279 | .3689 | 1.5164 | 0.0 | .0234 | 1.5847 | 0.0 | .2689 | .1689 | .5042 | .3361 | 0.0 | 1.4886 | .7843 |
| 27 | .5682 | .6364 | 0.0 | .5682 | 1.0227 | 0.0 | 0.0 | 1.6667 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8571 | 0.0 |
| 28 | .4658 | .1739 | .4969 | .5901 | 1.0559 | .0311 | 0.0 | 1.9255 | 0.0 | .1429 | 0.0 | .4286 | .0357 | .1071 | 2.1837 | .2857 |

*Underlining indicates visible behavioral styles, that is, where the style coefficient is greater than 1.0.

TABLE E-5

CLASS 5 - BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS

| Students | Teacher Directed Settings | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1 | 0.0 | .4731 | .2151 | .3226 | 1.8280* | .1075 | .1536 | 1.2186 | .5917 | .4024 | .2367 | .2367 | .1775 | 1.0059 | 1.5723 | .0986 |
| 2 | 0.0 | .4174 | .5217 | .2174 | 2.2174 | 0.0 | .1739 | 1.0725 | 0.0 | .5098 | 0.0 | .1961 | .0980 | .2451 | 2.1289 | .0654 |
| 3 | 0.0 | .1258 | 0.0 | .0943 | 2.9245 | 0.0 | 0.0 | 1.2159 | 0.0 | .1818 | .2273 | .7386 | .3977 | .0568 | 1.6558 | .4167 |
| 4 | 0.0 | 1.3223 | .3306 | .0826 | 1.5289 | 0.0 | .2834 | .7713 | 0.0 | .3429 | .3810 | .0952 | .1429 | .0476 | 2.3673 | .0317 |
| 5 | 0.0 | .3101 | .6202 | .4264 | 1.2403 | 0.0 | .0664 | 1.7829 | 0.0 | .4771 | 0.0 | .1376 | .0917 | .1835 | 2.2280 | .0612 |
| 6 | 0.0 | .0708 | .3540 | .1770 | 3.0531 | 0.0 | .1517 | .8850 | 0.0 | .0842 | 0.0 | .2632 | .2632 | 0.0 | 1.9850 | .5965 |
| 7 | .1908 | .2443 | .3053 | .0763 | 2.3664 | .0382 | .1309 | 1.2468 | 0.0 | .0563 | 0.0 | .2113 | .3521 | 1.0915 | 1.7103 | .1878 |
| 8 | 0.0 | 1.2245 | 0.0 | .4082 | .6122 | 0.0 | .0583 | 1.5646 | 0.0 | .0678 | .1695 | .2966 | .0424 | .0424 | 2.4939 | .0847 |
| 9 | 0.0 | .5600 | 1.6000 | .1000 | .6000 | 0.0 | 0.0 | 2.1333 | 0.0 | .1356 | .1695 | .2119 | 0.0 | 0.0 | 2.5666 | .0565 |
| 10 | 0.0 | .0396 | .1980 | .2475 | 1.7327 | 0.0 | 0.0 | 1.9472 | 0.0 | .4912 | .3509 | .4386 | .3509 | 0.0 | 1.5038 | .5848 |
| 11 | 0.0 | .0672 | 1.1765 | .1261 | 2.6050 | 0.0 | .0240 | 1.2325 | 0.0 | .1684 | .2105 | .3684 | .0526 | .0526 | 2.1053 | .3860 |
| 12 | .2809 | .9438 | 0.0 | .1685 | 2.2472 | 0.0 | 0.0 | .8989 | 0.0 | .3609 | .1504 | .1504 | .8647 | .0376 | 1.6971 | .3258 |
| 13 | 0.0 | .1441 | 0.0 | 0.0 | 1.4865 | 0.0 | .2574 | 1.9219 | 0.0 | .0381 | 0.0 | 0.0 | .0952 | 1.8095 | 1.7415 | 0.0 |
| 14 | 0.0 | .0261 | 0.0 | .0327 | 1.6667 | 0.0 | .2801 | 1.8519 | 0.0 | 0.0 | 0.0 | .1429 | .1429 | 1.7619 | 1.6599 | .0317 |
| 15 | .1786 | .4000 | .4286 | .1071 | 1.9643 | 0.0 | .0408 | 1.4762 | .1761 | .5070 | .1408 | .2113 | .6338 | .1056 | 1.7907 | .1408 |
| 16 | 0.0 | .0426 | 0.0 | .3723 | 2.7660 | 0.0 | .0608 | 1.1348 | 0.0 | .0625 | 0.0 | 0.0 | .1563 | 1.4063 | 1.5625 | .4167 |
| 17 | 0.0 | .2276 | .8130 | .1220 | 2.1545 | 0.0 | .0697 | 1.4092 | 0.0 | .0396 | .3960 | .2475 | 1.0891 | .0990 | 1.8953 | .0660 |
| 18 | 0.0 | .2623 | 0.0 | .1230 | 1.9262 | .0820 | .1405 | 1.5301 | 0.0 | .1569 | .3922 | .2451 | .2941 | 0.0 | 2.2969 | .0980 |
| 20 | 0.0 | .1772 | 0.0 | .0316 | 2.7532 | .1582 | .0181 | 1.2025 | 0.0 | .1176 | 0.0 | .3922 | .3431 | 0.0 | 1.7647 | .6863 |
| 21 | 0.0 | .0333 | 0.0 | .0417 | 2.1667 | .0833 | 0.0 | 1.7778 | 0.0 | .1185 | .1481 | .1481 | .5926 | 0.0 | 1.9259 | .4691 |
| 22 | 0.0 | .3396 | 0.0 | .1887 | .8019 | .0472 | .3504 | 1.9497 | .1825 | .0292 | 0.0 | 0.0 | .5839 | 1.3869 | 1.6893 | 0.0 |
| 23 | 0.0 | .2137 | .1527 | .1527 | 2.0992 | .0763 | .2399 | 1.2977 | 0.0 | .0392 | .5882 | .5882 | .2941 | 0.0 | 2.1289 | .1307 |
| 24 | 0.0 | .2222 | 0.0 | .1667 | 3.1667 | 0.0 | .1905 | .7037 | 0.0 | .4878 | .1626 | .2846 | .2033 | 0.0 | 2.1603 | .0542 |
| 25 | 0.0 | .5289 | 1.1570 | .1240 | .9504 | 0.0 | .3070 | 1.6253 | 0.0 | .0762 | 1.1429 | .3810 | .7143 | .0476 | 1.8776 | .1270 |

*Underlining indicates visible behavioral styles, that is, where the style coefficient is greater than 1.0.

TABLE E-6

CLASS 6 - BEHAVIORAL STYLES A-H AS DETERMINED BY CASES DATA IN TWO SETTINGS

| Students | Teacher Directed Studies | | | | | | | | Non Teacher Directed Settings | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | A | B | C | D | E | F | G | H |
| 1 | 0.0 | .5933 | .2871 | .3110 | 1.866 * | 0.0 | 0.0 | 1.3397 | 0.0 | 1.869 | .3738 | .7009 | .0935 | .9346 | 1.6555 | .0312 |
| 2 | 0.0 | .8757 | .2367 | .2071 | 1.7751 | 0.0 | .0338 | 1.2032 | 0.0 | .1412 | 0.0 | 0.0 | .1176 | 1.8824 | 1.2773 | .3922 |
| 3 | 0.0 | .8727 | .2727 | .3409 | 1.2955 | 0.0 | .0519 | 1.4091 | 0.0 | 0.0 | 0.0 | .3731 | 0.0 | 1.9403 | 1.5352 | 0.0 |
| 4 | 0.0 | .4310 | .7407 | .2862 | 1.5993 | 0.0 | .0577 | 1.5264 | 0.0 | 1.7778 | 0.0 | .2778 | 0.0 | 1.3889 | 0.0 | .7407 |
| 5 | 0.0 | .6947 | 1.2632 | .4737 | .8947 | 0.0 | 0.0 | 1.6316 | 0.0 | .3922 | 0.0 | .4902 | .3922 | 0.0 | 1.7927 | .3268 |
| 6 | 0.0 | .3478 | .3953 | .1383 | 2.6877 | .0198 | .1016 | .9618 | 0.0 | .1053 | 0.0 | .5263 | .1316 | .1316 | 2.3308 | 0.0 |
| 7 | 0.0 | .5490 | .7843 | .4902 | 1.4461 | .0245 | .0980 | 1.3235 | 0.0 | 1.6623 | 0.0 | .3896 | .1299 | 0.0 | 1.3729 | 0.0 |
| 8 | 0.0 | .4192 | .2620 | 0.0 | 2.2271 | .0437 | .0250 | 1.3974 | 0.0 | .0930 | 0.0 | 0.0 | .2326 | .1163 | 2.5914 | 0.0 |
| 9 | .1437 | .5517 | .4598 | .2874 | 2.2126 | 0.0 | .0821 | 1.0153 | 0.0 | .0976 | 0.0 | .3659 | 1.2195 | .4878 | 1.3240 | .3252 |
| 10 | 0.0 | 1.0769 | 1.1966 | .3632 | 1.3034 | 0.0 | .0122 | 1.1111 | 0.0 | 1.1000 | 1.5000 | 1.5000 | .1250 | 0.0 | .8571 | .0833 |
| 11 | 0.0 | .4521 | .7534 | .4110 | 1.4897 | 0.0 | .0098 | 1.5525 | 0.0 | 0.0 | 0.0 | .2899 | .0725 | 1.7391 | 1.5321 | .1449 |
| 13 | 0.0 | 1.4046 | 1.2214 | .2290 | 1.3359 | 0.0 | .1091 | .7888 | 0.0 | .2581 | .6452 | .3226 | .1613 | .6452 | .6452 | 1.5054 |
| 14 | .1059 | .4576 | .5085 | .3602 | 1.3559 | 0.0 | .0121 | 1.6949 | 0.0 | .1000 | 0.0 | 1.8750 | 0.0 | 0.0 | 1.6429 | .0833 |
| 15 | 0.0 | .7838 | .4054 | .1351 | 1.7568 | .0338 | 0.0 | 1.3288 | 0.0 | .8254 | 0.0 | .3968 | 0.0 | 0.0 | 1.8141 | .2646 |
| 16 | .1244 | .8557 | 1.8905 | .4478 | 1.2438 | .0249 | 0.0 | 1.1443 | .5495 | 1.3187 | .2198 | .3846 | .0549 | 1.2088 | .8791 | 0.0 |
| 17 | 0.0 | .1600 | .3429 | .3143 | 1.2571 | 0.0 | 0.0 | 2.0952 | 0.0 | .2000 | 1.7500 | .9375 | .1875 | 0.0 | 1.8214 | 0.0 |
| 18 | 0.0 | .9067 | 1.2444 | .6000 | 1.2444 | .0222 | .0127 | 1.1111 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0000 | 1.1429 | 0.0 |
| 19 | 0.0 | .2737 | .3158 | .3947 | 1.7895 | 0.0 | .0602 | 1.5263 | 0.0 | 1.0000 | 0.0 | .3571 | .2679 | 0.0 | 1.7857 | 0.0 |
| 20 | 0.0 | .6977 | .4651 | .2035 | 1.5988 | 0.0 | .0166 | 1.4535 | 0.0 | .1111 | 0.0 | .1389 | .1389 | 1.8056 | 1.4683 | .1389 |
| 21 | 0.0 | .6107 | .7634 | .3435 | 1.4885 | 0.0 | 0.0 | 1.4758 | 0.0 | .9811 | .3774 | .2830 | .2830 | .4717 | 1.4555 | .0629 |
| 22 | 0.0 | .2737 | .5263 | .3421 | 1.1579 | 0.0 | .0301 | 1.9825 | 0.0 | .1429 | 0.0 | .8036 | .0893 | 0.0 | 2.0918 | .1786 |
| 23 | 0.0 | .9677 | .6806 | .3024 | 1.6935 | 0.0 | 0.0 | 1.1828 | 0.0 | .7000 | .5000 | .1250 | .7500 | 0.0 | 1.7857 | 0.0 |
| 24 | 0.0 | 1.0667 | 1.0370 | .2222 | 1.4074 | 0.0 | 0.0 | 1.1852 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 25 | 0.0 | .5918 | .7143 | .1786 | 1.6071 | .0255 | 0.0 | 1.5136 | 0.0 | .4000 | .5000 | .3750 | .1250 | .2500 | 2.0714 | 0.0 |
| 26 | .5068 | .9730 | 1.7568 | .4392 | 1.2838 | 0.0 | .0193 | .9910 | 0.0 | .3077 | 0.0 | 1.5385 | 0.0 | .7692 | 1.3187 | 0.0 |

*Underlining indicates visible behavioral styles, that is, where the stylo coefficient is greater than 1.0.

# APPENDIX F

## TEACHER INTERVIEW SCHEDULE

## Instructions for Interviewer

The purpose of the teacher interview is to obtain information about certain teacher attitudes and expectations. In particular, it is designed to provide data concerning the teacher's perception of his (her) role as a teacher, his (her) class as a group, and individual pupils within his (her) class.

1. Since the objective of the interview is to discover what the teacher thinks and feels, it is important that the interviewer does not cue the teacher to give "acceptable" answers. The interviewer should be particularly careful to avoid asking leading questions and reacting in a judgemental way to teacher responses.

2. It is important that the teacher feel comfortable about discussing his (her) class and program. To achieve this goal it will be necessary for the interviewer to establish a relaxed, friendly and supportive atmosphere prior to and during the interview.

3. The interviewer will note that most questions have a number of sequential parts. In some cases the teacher will "take off" in response to the initial question and provide answers to subsequent parts. In other cases it will be necessary to work through each part of the question until all information has been obtained. It is important that we obtain complete answers. The interviewer must concentrate on the teacher's communication and allow himself when necessary to depart from the protocol questions for the purpose of satisfying the intent of the question.

4. The interview is to be carried out in two parts. Part I is to be conducted early in the first week of classroom observation. Part II is to be conducted during the final week of data collection, after classroom observation has been completed. Please tape each interview and label the tape according to date, Part I or II, and teacher's name. Please deliver the tape to Dave along with forms A, B, C, and D.

## P A R T I

The interviewer will explain that we are interested in obtaining detailed information about the class as a group and the program being offered. He will continue as follows:

First of all I'd like to ask you a few questions about your class. I know you can't think of the class without considering particular individuals, but at this time our primary concern is to learn about the class as a group. Therefore, please try to think in terms of your assessment of the group in general.

1. Could you tell me about the class - a) what kind of ability range exists? How are they doing scholastically? How are they doing in terms of social development?
   b) How do they compare, as a group, with other classes in the school? How do they compare with classes you have had in other years?

2. Which children in the class seem to be best liked by other pupils? Which ones seem to be least liked? Can you offer any reasons for this popularity or lack of it?

I'd like to move now to a few questions about your program and the procedures you've developed for facilitating the program.

1. a) What kinds of things do you think these children should be getting out of school?

NOTE: It might be necessary to prompt the teacher at this point with questions concerning the relative importance of cognitive and affective goals, which cognitive goals are most important, which affective goals are most important.

   b) Are the children achieving these goals to your satisfaction?

NOTE: If the answer to this question is "no" or that some pupils are not achieving, follow up by asking "can you suggest reasons why not?"

2. Would you explain how the curriculum for the class is determined? What is the relative influence of such factors as Department of Education directives, school policy, your own judgement and initiative?

3. Would you tell me about the texts that are used in your class? How were they chosen? To what extent do you find it necessary to complement them with other materials? What kinds of supplementary materials are used?

4. What kinds of activities do you emphasize in the classroom in an attempt to realize the goals of your program? With these children, are there certain activities that you feel work best?

5. I'd now like to get a little information about classroom routines.

   - Do you adhere strictly to a timetable?
   - What are your policies about children talking and moving around in the classroom?
   - Do you have particular routines regarding such things as arrival to the classroom, rest periods, cleaning up, dismissal?
   - Could you tell me what kinds of things you do when the children are not doing what they are supposed to? For example, making too much noise, not paying attention, telling on one another, and fighting?

6. Researchers have found that individuals view their responsibilities as a teacher in different ways. Would you tell me what you consider to be your most important tasks as a teacher?

## PART II

Interviewer's Introduction

In our first interview, you told me a number of things about your class and your program. You might recall, however, that we didn't talk very much about individual children. Today I want to ask you some questions that pertain to individual children.

1. First of all I'd like to have you respond to four hypothetical questions about the children in your class. NOTE: Read these questions:

   a) If you could keep one student another year for the sheer joy of it, whom would you pick?
   b) If you could devote all your attention to a child who concerns you a great deal, whom would you pick?
   c) If a parent were to drop in unannounced for a conference, whose child would you be least prepared to talk about?
   d) If your class was to be reduced by one child, whom would you be relieved to have removed?

2. I'd like to repeat these four questions now and ask you to name two additional choices for each question. REPEAT EACH OF THE FIRST FOUR QUESTIONS.

3. Would you like to tell me your reasons for nominating these particular children?

4. I have three additional tasks I'd like you to complete relative to the children in your class. They all have to do with giving your impressions of individual children.

   a) On this sheet (PROVIDE FORM A) would you rank the children in your class according to the extent to which you think they will do well in school.

   NOTE: The instructions for ranking have been kept deliberately vague to encourage teachers to use their own subjective criteria in making judgements. Should teachers ask about critera for ranking, the interviewer will indicate that they should base ranking on their own perception of doing well in school.

   b) On this sheet (PROVIDE FORM B) would you now rate each child in accordance with your judgement as to his usual attitude to classroom activities.

c) On this sheet (PRODUCE FORM C) would you now rate each child in accordance with your judgement as to his or her academic ability?

NOTE: As teacher is completing Forms B and C, the interviewer will examine Form A and identify the three students ranked highest and the three students ranked lowest.

5. I notice that you have ranked A, B, and C as highest and X, Y, and Z as lowest in terms of how well you think they will do in school. Could you give me your reasons for these choices?

- What factors entered into your choice?
- What special characteristics do these children possess or lack?
- Do you feel that these are permanent or temporary conditions?
- How long do you feel they will continue to do well or poorly in school?

NOTE: Interviewers should, if necessary, probe beyond this point in order to establish the extent to which teachers believe characteristics identified are permanent and unchanging.

6. I'd like to ask you one final question about your program. If you had complete freedom and authority to alter the program in any direction whatever, what, if any, changes would you make?

7. Finally, I would like to obtain some basic information about your personal and professional background. Would you take a few moments and complete this form before leaving? (PROVIDE TEACHER WITH FORM D).